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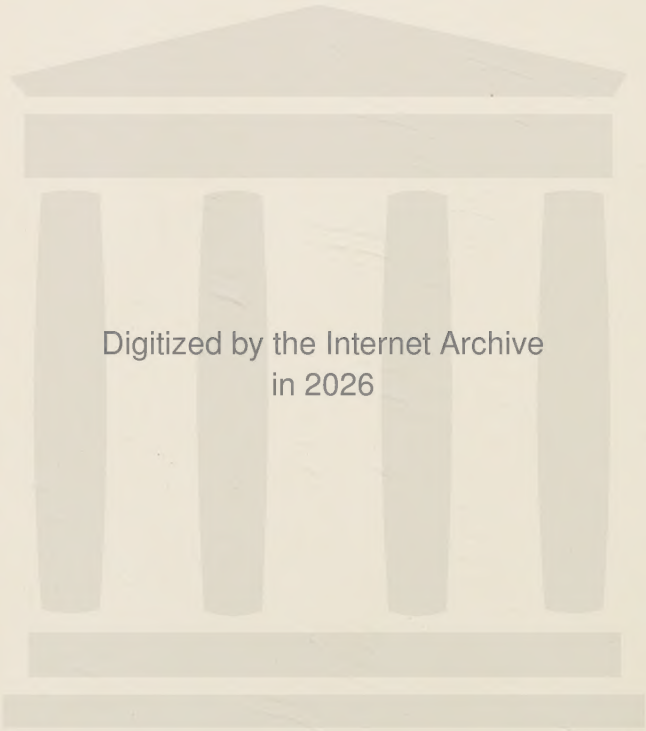

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PLATE I. HARROW HILL FROM THE AIR

Showing Camp and Two Mine Shafts. Excavation of a Shaft in progress, 1915.

PREHISTORIC SUSSEX

BY

E. CECIL CURWEN

M.A., M.B., B.CH., F.S.A.

With a Foreword by

O. G. S. CRAWFORD, F.S.A.,

Archæological Officer to the Ordnance Survey and
Editor of *Antiquity*

Copiously illustrated with Photographs from the Air and from the Ground, and with Drawings by

ROBERT GURD

SECOND EDITION

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TO MY FATHER

ELIOT CURWEN

F.S.A.

MY MONITOR AND COLLABORATOR

IN FIELD ARCHÆOLOGY

THIS BOOK

IS AFFECTIONATELY DEDICATED

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AUTHOR'S PREFACE

A LARGE part—perhaps too large a part—of this book is the outcome of some seventeen years' original study of the remains of prehistoric man in Sussex, obtained during caravanning holidays and Saturday afternoon rambles in company with his father, to whose copious and careful field-notes the author desires to acknowledge his indebtedness.

He has not attempted to compile a complete record of every known prehistoric site, still less a list of isolated finds of flint or bronze implements or other discoveries. It is hoped, however, that in the representative lists at the ends of the chapters readers will find some earthworks in their own district which will illustrate what is said in the text.

To the following societies and individuals the author wishes to record his gratitude for the loan of blocks: the Sussex Archæological Society, the Worthing Archæological Society, the Earthworks Committee of the Congress of Archæological Societies, the Economic History Society, Mr. Arthur Beckett (Editor of the *Sussex County Magazine*), the Editor of the *Geological Magazine*, and Mr. Henry D. Roberts (Director of the Brighton Museum). Individual acknowledgments are made under the respective illustrations.

E. CECIL CURWEN.

HOVE, 1929.

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FOREWORD

By O. G. S. Crawford

This is a book about the Downs and the open air. It is a book that could only have been written by an Englishman with a love for the country. It is a book for everybody, since it is written in plain, straightforward English ; but it is a book that every student of British Archæology must possess. Dr. Cecil Curwen has an intimate knowledge of his county, and were not the titles so hackneyed and vulgarised he might with full justice have called this book ' the real unknown, undiscovered Sussex.' For he describes things seen by few and recognised by very few indeed; and he does it in a way that will open the eyes of those who read. Sussex, with its ' Weald, its coast, and its Down countree,' is a microcosm of England. The real Sussex, therefore, is not just modern Sussex —a few towns and villages and bungalows placed amid beautiful scenery—but all that together with a tradition of ancient culture in the widest possible sense. It is this tradition which gives an individuality to Sussex and other geographically similar regions such as Kent, Dorset, the Yorkshire Wolds or the Marne District. The outward and visible signs are the prehistoric earthworks, roads and camps, together, of course, with those later manifestations which are beyond the scope of the present book. To those who know such at first hand, Sussex means much more than to those who do not. These latter unfortunates cannot do better than begin to explore the Downs at once, guided by this book and a good map.

It is a good and readable book because it is both old and new. It is old in the sense that it follows on in the direct line of tradition of English Archæology, which has always been at its best in the open air,

from the days of Aubrey, Stukeley, Colt Hoare and Pitt Rivers down to the present day. It is new because it is up to date ; that is to say, it is written by one who is armed with modern weapons of discovery —surveying instruments, air-photographs, rammers; and who has used them himself to good effect in the advancement of knowledge. Moreover, though 'local' in the sense that it deals only with a portion of a large island, it is not a book that can be set down as of 'merely local interest.' (Actually, indeed, such books are less common than is often supposed). Dr. Curwen is the first to publish a plan of any of our neolithic camps, since these were known as a distinct and recognisable type. He has himself, with his collaborators, excavated two of them (the Trundle and White Hawk), thereby proving their neolithic date. His chapter on 'the Detection and Mapping of Earthworks' is, so far as I am aware, the fullest and best guide for the field-archæologist in this subject.

One cannot, in writing a foreword, make comparisons as one could if one were writing a review ; but, in fairness to both author and reader, a distinction must be emphasised. To-day, archæology is undoubtedly popular. Books are published which formerly would have remained in manuscript. Some of these are good, some are not. The ordinary reader, who takes a book up in a shop and turns over the leaves, cannot always decide for himself. It is to help him to decide that this foreword has been written. He need not hesitate to buy this book (it is not the sort to borrow because it will certainly not be returned). The author might well have taken as his motto the text printed by Sir Richard Colt Hoare at the head of the first and finest monument of English field-archæology—'We speak from fact, not fiction.' The reader who prefers fiction is well supplied already ; here he will find only the truth.

O. G. S. Crawford.

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PREHISTORIC SUSSEX

Chapter I

INTRODUCTION

> Speak to the feeble, O Stone, after Selma's race have failed! . . . thy whistling moss shall sound in his dreams; the years that were past shall return. Battles rise before him, blue-shielded kings descend to war. . . . He shall ask about the stone, and the aged shall reply, 'This grey stone was raised by Ossian, a chief of other years!'
>
> —Ossian.

Deep down in the hearts of most of us there lurks a certain veneration for the things of old—the relics that have survived the storms of time and speak directly to us of those far-off days about which we used to learn in our history books at school. To such the moss-grown mound that marks the resting-place of some forgotten chieftain is a thing of mystery and romance—a relic that has survived the levelling hand of time and speaks of other days, so different from our own—a problem, too, that invites inquiry and solution. To many others, if they trouble to think of it at all, it is nought but a mass of earth, doubtless containing an old crock and some mouldering bones, but having no conceivable bearing upon the pressing problems of to-day. Such people have other interests just as engrossing, and experience teaches that it is quite useless to try to convert them, for they lack the faculty for the romance of the past. It is not to such that this book is dedicated, but to those in whose hearts chance allusions to the things of ancient times have evoked strange yearnings to know more, to

probe the mysteries of the past, and to bring to life again those dim people of old who, generation after generation, lived and loved and died in the land that is now our home.

The object of the book is to put before the general reader a simple account of the principal prehistoric antiquities of the county of Sussex, and this in a form that will not only give him a bird's-eye view of the whole, but will provide him with sufficient material, both topographical and bibliographical, to enable him to make an independent study of them himself if he should wish to do so. There are few more exhilarating open-air hobbies than field archæology, requiring as it does comparatively little technical knowledge, but rather the constant exercise of powers of observation and common-sense deduction. It provides also a motive for rambles in the wilds, and exercises at the same time those intellectual powers the prevalence of which is attested by the popularity of cross-word and jig-saw puzzles. Finally, this hobby satisfies two instincts common to most of us—those of hunting and collecting, and those who take it up have something permanent to show for their labours, in notes, surveys and finds. In this scientific age, however, we scarcely need to be reminded that archæology stands for the acquisition of knowledge rather than curios, and that objects found should be valued chiefly for what they can tell us of the lives of vanished peoples and of the development of ideas, rather than as curios or antiques.

It may be well to remind the reader to whom the subject is a new one, that the unmeasured ages during which man has existed before the dawn of recorded history, are divided into periods based upon the principal characteristics of their respective remains. As this classification is a necessary basis of all study of the subject, it is well to have a clear conception of it at the outset, and also to be able to form some sort

of mental picture of what these periods stand for, so that they may be to us something more than mere names. For this purpose it has been possible to assign very rough and approximate dates to the later periods, so that our finite minds may have something tangible from which to form an idea of what is implied, for instance, by the term ' Bronze Age.' If we can, in addition, correlate some of the epochs of our prehistory with familiar events and incidents of Biblical and Classical history, our conceptions will be still more concrete, for it is only from the familiar that we can proceed to an understanding of the unfamiliar.

The prehistoric periods are thus briefly set forth in tabular form :—

Period.	*Approximate Dates for Britain.*	*Familiar Contemporary Events.*
Palæolithic, or old Stone Age.	Immense antiquity.	—
Neolithic, or later Stone Age.	Ended about 1800 B.C.	Ended about the time of the patriarchs Isaac and Jacob.
Bronze Age.	1800 B.C. to 500 B.C.	From the patriarchs to the fall of Babylon and battle of Marathon.
Early Iron Age.	500 B.C. to A.D. 50.	From time of Ezra and Nehemiah to that of the Apostles.
Roman Period.	A.D. 50 to 400.*	—
Saxon Conquest.	Roughly A.D. 500.	—

* The exact dates of the Roman period, as commonly accepted, are A.D. 43–410 or 450, but those in the text are intentionally given in round figures, as being more easily memorised.

Various efforts have been made to assign provisional dates for the palæolithic and the beginning of the neolithic periods, but in the author's opinion

these are wholly unreliable owing to necessarily insufficient data. The later periods can only be dated by means of the links that have been discovered between them and the known chronologies of the civilisations of Egypt and Mesopotamia. For the present we must be content with regarding the palæolithic period as stretching back into the immense antiquity of the later geological ages. It is divided into several subperiods named after sites, mostly in France, where various distinct cultures have been discovered. The technical distinctions between the flint implements of these epochs are, however, beyond the scope of this work, and as Sussex contains scarcely any known occupation sites of the palæolithic period and relatively few of its flint implements, we shall not do more than describe briefly the famous Piltdown skull, the fragments of which were found in about 1911 by the late Mr. Charles Dawson in a gravel-pit by the side of a farm road on Piltdown Common, near Fletching. The interest of this skull lies in the fact that it is one of the oldest known specimens in the world that has any claim to be regarded as human, and the individual to whom it once belonged is classed by scientists in a genus intermediate between ape and man—the so-called *Eoanthropus Dawsoni*. According to Sir Arthur Smith-Woodward most of the features of the cranium are human, while those of the lower jaw are essentially ape-like. The thickness of the brain-case, however, is from two to three times that of any modern European example, and the brain-capacity, measured by the capacity of the brain-case, is about equal to that of the lowest existing Australian aborigines. With the skull were found remains of the elephant, mastodon, hippopotamus, red deer and beaver, though the first two are considered to belong to a still earlier period. These, together with the flint implements found in the same stratum, indicate that the Piltdown lady lived in the early Pleistocene

[*From Sussex Arch. Coll. LXVII*

PLATE II. The Shaft of a Neolithic Flint Mine on Harrow Hill, near Worthing,

period, and belonged to a culture called Chellean, which flourished right at the beginning of the Palæolithic or older stone age.* (Plate 32.)

It should be pointed out that there is no hard and fast dividing line between the different periods in any locality, but that there was in most cases a considerable overlap. Thus, while flint was the principal hard material used for tools and weapons in the Neolithic period before the introduction of metal, it continued to be so used for centuries side by side with bronze, and some forms of flint implements, such as the barbed arrowhead, are characteristic, not of the Stone Age, but of the Bronze Age.

By what criterion are we to judge where history begins and prehistory ends? Here, again, there is a considerable overlap, and our choice must necessarily be somewhat arbitrary. The essential distinction lies in the fact that in the one our knowledge of the times is principally derived from written records, while in the other it is chiefly learnt by the spade of the excavator. It is proposed in this book to take the Saxon Conquest as the turning-point about which prehistory becomes history, because through it a complete break in the continuity of life and customs occurred, together with a change of race among the common people, and not merely in the ruling classes. Moreover, it was the incoming race of English who first began, albeit not immediately, to keep written records of their own history. Their predecessors, the Britons, or Celts, have left us no such records, and it is only through Greek and Roman writers that we know anything of them even during the Roman occupation.

The break of continuity that occurred at the Saxon Conquest has lately been somewhat in dispute in regard to England as a whole, but recent study of the Celtic and English settlements in the south-east of

* *Quart. Journ. Geolog. Soc.*, LXIX (1913), pp. 117-151.

England have established it beyond a doubt, as far, at least, as this area is concerned. This needs emphasising because it is of fundamental importance in the right understanding and interpreting of the ancient earthworks and other remains that have come down to us.

The Britons and other prehistoric races that inhabited the country before the coming of the Saxons were hill-folk, dwelling in the uplands on exposed ridges and hill-slopes and in hill-top fastnesses, and avoiding the valleys. The hut-circles of Dartmoor, for instance, which seem to have been inhabited during the Bronze Age, are seldom situated below the 900 ft. contour line, nor above the 1500 ft. line, the commonest level being about 1200 ft.

When, however, the Saxons came we find them settling on plains and in valleys by rivers and streams, and clearing the forests. The upland British villages were sacked and left desolate, and seem seldom, if ever, to have been inhabited by the new settlers.

Intermediate between these two extreme types—the upland Britons and the lowland English—were the Belgae, a race which invaded south-east Britain about a hundred years before the Romans came. These people, probably themselves of Teutonic blood, already showed something of the Teutonic tendency to lowland settlements. They seem to have been responsible for the earliest river-side cities such as Canterbury, London and Winchester, and the polygonal plan of the ramparts of Chichester has been attributed to the same people. Very little, however, is yet known for certain of the characteristics by which Belgic remains may be distinguished.

The influence of the Romans was not sufficient to alter the topographical distribution of the native settlements, and the Romanised Briton continued to inhabit the heights as his fathers had done before

him. The Roman officers, drafted from all the races of the known world, seem to have had a very general partiality for the valleys and plains, judging from the distribution of their villas and cities, but the hills were by no means despised. To them we owe in Sussex the city of Anderida (Pevensey) and the villa at Bignor, both lowland sites, and also the fortification of the Belgic city of Chichester, as well as numerous minor remains scattered over hill and plain.

If we stand on the crest of the Downs in the western half of Sussex we are in a position to appreciate the broad geographical features which form so important a factor in the early history of the county. We are standing on a long, narrow chain of dry chalk hills stretching from Beachy Head to the Hampshire border—a distance of about fifty miles—and averaging four to five miles in breadth. They are called the Downs, which is old English for ' the hills,' and at the present day they are sparsely inhabited and contain large areas of upland pasture and some unenclosed arable, while in the west there are considerable stretches of beech-wood which were probably much less extensive in early times.

To the north of us stretches a great well-wooded plain, rising gently to the forest ridge of central Sussex, and stretching away beyond to the Surrey hills. It is called the Weald, a name which in old English meant ' the forest,' and which serves to remind us that this great plain was, even as late as the times of the early English, a vast forest, though now it is chequered with enclosed fields and meadows and dotted all over with villages and farms. The original form of the name was Andredsweald, which is a kind of translation into English of the older Roman name, Anderida Silva. The existence of this great forest would lead us to expect to find very little trace of the Britons in this area, and this, as will be seen, is actually the case.

WEST SUSSEX
Shewing principal antiquities referred to in text.
Rectangular divisions provide key to six inch
Ordnance Survey sheets.
F O R E S
R. ARUN FORMERLY TARRANT
R. ROTHER FORMERLY SHIRE
HARDHAM
BOW HILL
TRUNDLE
REWELL HILL
ROMAN ROAD TO WINCHESTER & BITTERNE
CHICHESTER
C O A S T A L
BOGNOR
SELSEY
Contours
Above 600'
600' to 400'
400' to 200'
0
5 Miles
10
15

[Based upon the Ordnance Survey Map, with the sanction of the Controller of H.M. Stationery Office.

The third main geographical feature of the county lies to the south of us in the shape of a flat plain which stretches between the Downs and the sea to the west of Hove. Its widest part is in the longitude of Chichester, where it measures about ten miles from East Lavant to the tip of Selsey Bill.

These three natural divisions of the county—the Downs, the Weald and the coastal plain—hold the key to the archæology of Sussex.

Before the coming of the Saxons practically the whole population of this district lived on the Downs and to a less extent on the coastal plain, as at Selsey and Chichester.*

The first visits of the Saxons to Sussex were in the nature of raids, but when in the year 477 they came with the intention of settling, they landed near Selsey and, according to the chronicles, proceeded to drive the Britons eastwards along the Downs till they finally annihilated them at the siege of the Roman fortress of Anderida, the walls of which still form the outer courtyard of Pevensey Castle, near Eastbourne. How stubborn was the defence put up by the Britons is indicated by the fact that thirteen years elapsed between the landing of the Saxons and their victory at Anderida. There are no archæological grounds for disbelieving the chronicles in any of these particulars. The Saxons were ruthless barbarians who burnt, looted and massacred wherever they went ; evidence of this is amply forthcoming in Wiltshire and elsewhere, where the remains of British villages and

* It would not be quite accurate to say that there were no settlements in the Weald in prehistoric times. Flint implements of all periods are found from the palæolithic to the Bronze Age, but these need not always necessarily imply permanent settlement, though the large number of pigmy implements and chips at certain points on the forest and lower greensand ridges certainly seem to imply something more than brief occupation. There are also some large burial mounds, probably belonging to the Bronze Age, situated on the greensand ridge just north of the Downs in the far west of the county. A few Roman settlements, as the villa at Bignor, the cemetery at Hassocks, and the stations at Hardham and Alfoldean, are all connected with Roman roads that crossed the Weald.

towns have been unearthed showing gruesome traces of fire and slaughter. We have no reason to believe it was otherwise in Sussex. The British villages were never rebuilt, and the whole stretch of the Downs remained an uninhabited wilderness for many centuries. No Saxon or English ploughs blotted out the traces of the tragedy, and when time had removed all that was perishable that the fire had left, there remained, and in many places still remain, the mounds and banks and cultivation terraces which it is our purpose to study in this book (compare Plate XX). It is only little by little, and in comparatively recent times, that men have with their ploughs encroached once again on those silent sweeps of Downland which were once so populous.

The Saxons were superstitious ; they were frightened of the ghosts of those they had murdered, and they made it a habit never to dwell in the cities of the slain. They had, besides, no love of the hills, but preferred the sheltered valleys and plains, and were not afraid of the forest. So they shunned the hills, as we have seen, and settled instead on the coastal plain, and beside the rivers that flow through the Downs, and formed a chain of settlements in the Weald, under the shelter of the steep north slopes of the hills. In course of time they planted a few manors among the Downs, but almost always in the valleys ; very few indeed were situated on hills. As far as we know, most of these Saxon settlements have survived to the present day in the form of villages and farms with which we are all familiar.

Thus we see that with certain few exceptions we have the broad guiding principle that the Britons lived on the Downs, the Saxons in the Weald, while Britons, Romans and Saxons in succession colonised the coastal plain. It is easy to see how fortunate it is for us that the Downs have been so little disturbed by subsequent habitation. We are further fortunate

in that the chalk of which the Downs are composed retains permanent traces of such interference with its surface as is incidental to man's settlement upon it. Although a mound or bank forming part of a prehistoric village may have been levelled by modern ploughing, yet the pit or ditch from which was obtained the material that went to form the mound always remains. It may have been filled up level with the rest of the ground, yet it can be traced by sounding, by digging, and by photographs taken from aeroplanes. This is not so easy on the soils which underlie the Weald and coastal plain. There the disturbed and undisturbed soils may be very difficult to distinguish, so that earthworks, once destroyed, may not be traceable again. And it is just in these two regions that any ancient remains that may have existed have been most thoroughly effaced by centuries of subsequent ploughing. It is, therefore, pre-eminently to the Downs that we must look for the prehistory of Sussex.

A word may be said with regard to practical points in connection with this study. Rambles in search of earthworks and other prehistoric remains give one a very detailed and intimate knowledge of the countryside, and this is enormously facilitated by the use of large scale Ordnance maps, such as those of a scale of six inches to the mile. For those who are not familiar with these invaluable guides a word of introduction may not be out of place. The scale being such a large one, it takes some 285 quarter-sheets to cover the whole county of Sussex, each quarter-sheet measuring 18 by 12 in. in addition to margins, and representing a piece of country only three miles long by two miles wide. This makes possible the representation of a wealth of local detail, so that all hedges, ponds, wells, clumps of bushes, as well as buildings are marked, thus providing ample land-marks for the field-worker. The Sussex Archæo-

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[From Sussex Arch. Coll. LXVII

PLATE III

1. Miners' Picks made of Red Deer's Antler, from Harrow Hill Flint Mine.
2. Underground Gallery in Harrow Hill Mine, after excavation.

logical Society has in its keeping a complete set of these maps, sheets of which may be loaned to those who are prepared to undertake field-work in their district and to mark on them any details of archæological importance. This set has been provided by H.M. Ordnance Survey, and details entered on them may, if verified, be included in the next revision. Some of the smaller local archæological societies likewise possess six-inch maps of their immediate districts for the use of their members. Where such facilities are not available quarter-sheets can be bought at 2*s*. each.

On the maps on pp. 8, 9, 24 and 25 the positions of a number of the principal earthworks are shown, but owing to the small scale it would be impossible to mark on them all the sites enumerated in the appendices to the different chapters. In the latter, however, the number of the sheet of the six-inch O.S. map on which each site falls is quoted, while the small-scale maps here given are ruled in such a way as to provide a key to the six-inch sheets, thus indicating the approximate location of any site mentioned in the appendices.

In the chapters that follow an attempt will be made to describe the principal prehistoric remains in Sussex in such a way as to illustrate something of the life and habits of the people who made them.

Chapter II

THE FLINT MINES

He breaketh open a shaft away from where men sojourn . . .
He putteth forth his hand upon the flinty rock . . .
He cutteth out passages among the rocks,
And his eye seeth every precious thing.

—Job (R.V.).

Relics of the Stone Age abound in many of our ploughed fields, especially on the Downs, but, as has been hinted in the last chapter, flint implements shaped by the hand of man may be found also in the Weald. It is not our purpose to explain in detail how humanly made tools may be recognised, still less to discuss their varying types and characteristics, for that has been very ably done by others. Very few implements of the Drift, or earliest palæolithic types, have been found in Sussex, and these have mostly come from the Eastbourne district and from the river deposits in the west of the county.* At many places along the crests of the sandy ridges of the Weald both of the forest and lower greensand, tiny flakes of flint may be found bearing minute secondary chipping, so fine that in many cases a magnifying glass is almost needed to see it. Such tiny implements, known as "pygmies," and the worked flints and implements that are found on the Downs may belong to any part of the Stone and Bronze Ages, but though certain types are characteristic of certain epochs, it is not safe to argue

* See *Sussex Arch. Coll.*, LXX, pp. 172-82.

that they were not used in other epochs. This is clearly brought out in the case of the flint-mines.

It may be a surprise to many of us to learn how comparatively highly developed man had become in certain directions by the close of the neolithic period (say, about 2000 B.C.). Evidence exists of an organised industry for the production of flint implements, for man had learnt that in order to be able to produce the highest quality of axe or other tool, he must seek the best quality flint from which to make it, and further that this was only to be found by mining for it deep in the chalk where it exists in the form of nodules lying in seams or veins. Flint that has been lying on the surface of the ground is of little use, as it has become tough through exposure. He probably learnt of the existence of these veins of flint by coming across them accidentally when digging for other purposes, or he may have found them outcropping on the side of a hill.

Sussex is particularly rich in these flint-mines. Five groups lie within a few miles of Worthing, namely, on Cissbury Hill, Church Hill (Findon), by Tolmere Pond, on Blackpatch Hill and on Harrow Hill. Three more groups of mines lie near Chichester, namely, on Stoke Down and Bow Hill and the so-called Lavant Caves, and a suspected group lies on Windover Hill, near Eastbourne, just above the figure of the Wilmington Giant. Almost the only other mines of importance in England are a large group called Grime's Graves at Weeting in Norfolk, while in the neighbourhood of Mons in Belgium are some remarkable examples at Spiennes, Obourg and elsewhere.

A group of mines consists of a large number of pits or shafts—often over a hundred—sunk close together. They are not deep, being anything from ten to fifty feet in depth, and from three to sixty or seventy feet in width. Nevertheless they are in reality the proto-

type of the shafts of modern coal-mines, and they represent one of the very earliest stages in the art of mining. From the bottoms of these shafts underground tunnels, or galleries, were driven in all directions to follow a seam of flint, and these generally communicate with galleries from other shafts so as to form quite a honeycomb of underground workings (Plate II). When the miners had worked out one shaft they proceeded to sink another close by, and in doing so they filled up the old shaft with the chalk which came out of the new one. Thus each pit was filled up in turn, and this has in reality proved to be the means of their preservation, for if the walls of the shafts and galleries had been left exposed to the air, the soft chalk would in a very few years have crumbled away and caved in. At the present day, therefore, a group of flint mines appears as a number of slight circular depressions in the ground, in which the grass grows greener and longer, and over which the earth sounds hollower to the tread, while between these hollows are irregular mounds representing all that is left of the debris of the miners' workings (Plates I and XIII).

In order to learn more of these mines and of the men who worked them it is necessary to dig down and remove all the accumulation of loose chalk with which they were filled. Several of the shafts at Cissbury were thus excavated in the 'seventies of last century by Lieut.-General Pitt Rivers (then Colonel Lane Fox), Messrs. Willett, Tindale and Park Harrison. More recently some were opened on Stoke Down by Major Wade, and on Blackpatch and Harrow Hills by the Worthing Archæological Society.

While engaged in the two last-mentioned excavations, the writer found that it was a common misconception on the part of visitors that it was the excavators who were digging the mine and making the galleries! 'How do you know how far to go

[*From Sussex Arch. Coll. LXV*

1. Miner's Pick-holes in the Wall of a Gallery in the Blackpatch Flint Mine.
Arranged in two rows in order to wedge out the intervening block of chalk.

PLATE IV

2. Surveying in an Underground Gallery at Harrow Hill, about 40 ft. in from the entrance.
The soot-marks over the surveyor's head are from the original miners' lamps, and are about 4,000 years old.

Flashlight photographs by the author.

down ? ' they would ask. It is thus necessary to explain that the shaft and galleries were opened by the old miners some four thousand years ago, and that all that the excavators do is to clear out the loose chalk with which they were afterwards filled, and they go on doing this until they reach the bottom of the original shaft.

Buried in this loose chalk we often find relics left by the miners—picks made from the antlers of red deer (Plate III, 1), and shovels made from the shoulder-blades of oxen. One such shovel at Harrow Hill was actually provided with a socket into which fitted a handle made of deer's antler—quite a unique specimen. This serves to remind us that the Latin word *scapula* (shoulder-blade) originally signified an instrument for digging, and that in all probability our word ' shoulder ' meant the same thing.* We also find flint implements in all stages of manufacture—occasionally a perfect axe, but more frequently ' wasters ' that have gone wrong in the making and been thrown away (Plate VI). Flint wedges and hand choppers used as tools in the mining are also found, but all traces of tools made with wood have, of course, disappeared long since.

One very interesting feature occasionally met with is in the shape of scratch-markings made by the old miners by means of a sharp flint on the wall of the shaft or on a loose block of chalk. They generally consist of a number of parallel straight lines which may have served as tallies for reckoning loads of flint or the like, but in at least one instance the device was a complicated one of straight lines forming an irregular chess-board with ladder-patterns (Plate V). This was more reminiscent of a child's scribblings on blotting-paper than anything else, and seems to represent the product of a few moments' idleness on the part of a miner!

* See *Sussex Arch. Coll.*, LXVII, pp. 139-145.

That some, at least, of the flint nodules were worked into implements on the spot is shown by the discovery of little collections of chips of flint, or 'flakes,' here and there in the filling of the shaft. In the entrance to one underground gallery in the mine excavated on Harrow Hill was a pile of such flakes which, when washed, weighed about 30 lb. The flint-knapper had sat there in the shelter of the gallery to make his axes, and just outside in the shaft we found the ashes of his fire.

When the excavation of the shaft has proceeded low enough to allow us to enter the underground workings, the interest is redoubled. A light is brought and we peer in. The floor is littered with broken chalk to a depth of 12 to 18 in., leaving a space of only about 18 in. between it and the roof. A long dark tunnel stretches before us. On one side chalk blocks have been built up into a rude wall, partly to get them out of the way, and partly, perhaps, to support the roof. On a pile of chalk in the corner is a little heap of wood-ash, perhaps the remains of a torch. Slowly and with awe one of the excavators creeps into the gallery, candle in hand, noticing everything, and careful to disturb nothing. He is acutely conscious that he is the first human being to enter this underground workshop for some four thousand years. Suddenly he catches sight of a row of holes cleanly punched in the chalk wall, with a second row below and nearly parallel with it, while on the floor close by is a pick made from the antler of a red deer. By means of these two rows of holes a miner had been about to split out the intervening block of chalk, when for some reason he dropped his pick and left (Plate IV, 1). And there the holes look as if they had only been made yesterday, fresh and clean-cut, with the chalk burred a little at the lip by the pressure of the pick.

Progress along the gallery is far from easy. One

must crawl on elbows and stomach, trailing useless legs over hard and angular pieces of chalk, one's fingers spluttered with candle-grease. It is warm, and the silence is intensified by the tiny, far-away song of the mosquitoes who have found their way through the chinks in the chalk to this subterranean place of repose. In the corners is a thick, white, snow-like deposit. It is in reality a kind of snow, called *flos ferri*, but is formed of crystals of chalk rather than of water, and it represents, if one may change the metaphor, the dust, not of centuries merely, but of millenniums.

On either side at intervals are entrances to other galleries, wholly or partly closed with stacks of chalk blocks. Here and there on the walls or roof a black mark is seen (Plate IV, 2). This is actually the soot from the old miners' lamps, still there, and looking perfectly fresh after the lapse of four thousand years. The great events and personages of history pass in array before our minds—William the Norman, Cæsar, David, Abraham—and yet those simple soot-marks were there before them all!

The longest gallery of the mine excavated on Harrow Hill extended for fifty feet from its entrance. The majority of the workings are not so extensive. In some, the roof was so unsafe that exploration was impossible, and it was generally found that where the miners had shored up the roof with chalk blocks it was unsafe to remove them. Eloquent testimony to the danger of mining in those early days is borne by the discovery in a mine at Obourg in Belgium of the skeleton of a miner, pick in hand, buried by a fall of chalk.

We have already anticipated conclusions regarding the antiquity of these mines by assigning them to the latter part of the neolithic period, say 2000 B.C., or thereabouts. It now remains to review the evidence on which this conclusion is based.

The principal evidence is afforded by the flint implements. Among these are found types characteristic both of the palæolithic and of the neolithic periods. This fact has led some archæologists to suggest a possible palæolithic date for the mines, especially as polished axes—that special feature of the neolithic period—have scarcely ever been found in them. Others have wondered where palæolithic man obtained his flint, and so have thought that mines may have been worked on the same spot in both palæolithic and neolithic times, but there is a feature about flint which happily enables us to be certain that the mines so far excavated in Sussex were worked in one period only. This feature is the property called *patination*. We are all familiar with the fact that the broken flints we meet with on ploughed fields are of various colours ; some are black, some white, others grey, and others again are of a mottled bluish colour. These differences in colour are due to different degrees of patination. If a white flint be broken across, the interior will generally be found to be black, though flints from different sources differ somewhat in their natural colour. The outside of such a flint has undergone a physiochemical change resulting from prolonged exposure to certain influences which have caused the naturally black flint to become white. If these influences, whatever they may be, have acted on the flint for a shorter period, or if they have not been so strong or so concentrated, the white covering, or ' patina ' as it is called, will not be so thick, with the result that the black core of the flint will be partly seen through the patina, resulting in a grey or mottled bluish appearance.

What these influences are is not fully known, but three factors seem to be important : (1) the nature and source of the flint, for some flints seem to patinate more readily than others ; (2) the presence of chalk, for flints do not appear to patinate so readily in sandy

Photographs: E. C. C.]

[*Reproduced from Sussex Arch. Coll. LXVII*

PLATE V

PATTERN SCRATCHED BY A MINER ON THE WALL OF A SHAFT AT HARROW HILL.

Left: Its position beside the mouth of a gallery. *Centre and right*: Details of the pattern.

soils ; and (3) the presence of vegetable mould, for flints do not easily patinate in chalk apart from mould. It has also been suggested that the degree of moisture has an important bearing on the question.

Now the experience of the excavators of these mines is this, that those implements and flakes which are found in the mould covering the filling of the shaft are always patinated a thick white, and that in some cases the patina itself was disintegrating. In the chalk filling, immediately under the mould, the flints are patinated a thinner white ; lower down they are grey ; lower still, mottled blue ; while in the lowest part of the shaft they have practically no patination at all. The upper surface of a flint as it lay in the filling of the shaft was sometimes found to be patinated to a greater degree than the lower surface. Thus it will be seen that the degree of patination depends upon the depth at which the implement has lain in the shaft.

Now, as we know from the unweathered condition of the chalk walls that the shaft must have been filled up all at one time and not at different dates, it follows that this difference in degree of patination does not indicate a difference in age of the implements in question, but is simply a matter of proximity to the surface, and, as we believe, to the vegetable mould covering the shaft. If, therefore, for the sake of argument, this be a neolithic mine, and some of the implements of palæolithic form found in it had previously been lying about on the surface of the hill, they would assuredly have been patinated a thick white, even though they might now be found deep in the shaft. This, however, is never the case, but patination is always inversely proportionate to the depth at which the flint is found in the shaft, and bears no relation to the apparent age of the type of implement. This shows conclusively that all the implements found in the shaft belong to the same date.

It follows that this date must be determined by the latest type of implement represented, and not by the earliest, and, further, that the apparently earlier types must in reality be looked upon as survivals of type. The most highly developed and therefore, presumably, the latest type found in the flint-mines is the so-called *celt*, a beautifully chipped axe-head with straight and parallel or converging sides. Celts of this kind are often found elsewhere partly or wholly ground and polished, though they have very rarely been discovered ground at the site of a flint-mine. The reasonable inference appears to be, not that the mining industry represents a culture earlier than that of the polished axe, but that the product of the mines was marketed for working, possibly in its raw state, but also in the form of axes chipped and flaked and ready for completion on the whetstone elsewhere. There can be no doubt that, whether polished or not, these celts are the most highly developed form of axe made by the ancients, excepting only the perforated axe-hammers which are known to belong to the Bronze Age. This line of argument would lead us to place the flint-mining industry shortly before the Bronze Age, i.e., somewhere towards the end of the neolithic period.

We have now to see how other lines of evidence fit in with this conclusion.

(1) Human skeletons, which have been found in mines at Cissbury and Grime's Graves, Norfolk, belong to a type which is known to have been prevalent during the neolithic period, though it also existed both before and after that time, and, indeed, exists at the present day, especially in South Wales, the west of Ireland, and parts of west and south Europe. It is called the Iberian type and is characterised by short stature, with long heads and rather weak faces. This evidence, therefore, is compatible with a late neolithic date for the mines, but is not conclusive in itself.

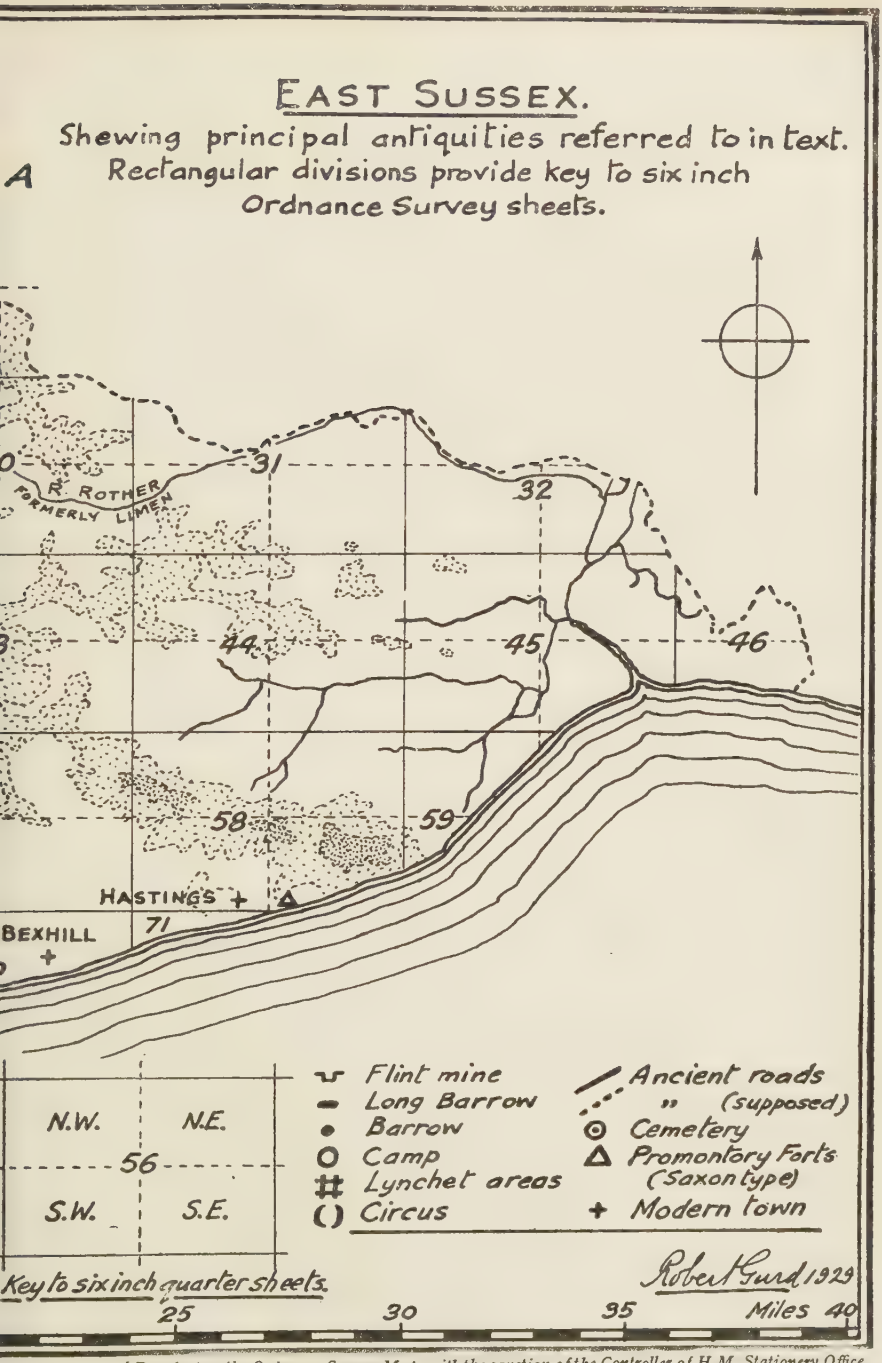
(2) The bones of animals that occur in the mines are those of species that certainly existed in the neolithic period, such as the ox, pig, sheep, and red deer. Some of these are not known to have existed in palæolithic times, while the animals that are known to have existed then, such as the bear, rhinoceros, mammoth and reindeer, are conspicuous by their absence from the mines. This evidence, then, narrows us down to a neolithic or later date for the latter.

(3) Deep in one of the shafts on Stoke Down, near Chichester, Major Wade found part of a grain-rubber of a kind that was in use from the latter part of the neolithic period down to about the coming of the Romans. This indicates an acquaintance with corn, which does not seem to have been introduced into this island much before 2000 B.C., although it was known and used in Mesopotamia and Egypt at a much earlier date.

(4) Some chalk loom-weights, which were used in the process of weaving cloth, were found in a shaft at Cissbury by Mr. Tindale. Cloth was made by the neolithic inhabitants of the Swiss lake-dwellings, but it is not known to have been used in Europe before that time.

(5) The consistent absence of metal or of flint implements or other objects characteristic of the Bronze or later ages, though somewhat risky, as all negative evidence is, practically narrows us down to the late neolithic period as the date of the mines, though it does not absolutely rule out an early Bronze Age date. The introduction of bronze as a medium for the manufacture of tools and weapons was very slow and gradual. As long, therefore, as good quality flint was of commercial value, so long is it likely that men took the trouble to seek for the best. And good flint would only cease to be of commercial value when metal became so abundant that

FOREST OF ANDER
SAXONBURY
PILT DOWN
R. OUSE
FORK R.
MEDEWAY
CABURN
R. CUCKMERE
LONGMAN
WINDOVER HILL
SEAFORD
EASTBOURNE
Contour
Above 600'
600' to 400'
400' to 200'
0
5 Miles
10
15



[Based upon the Ordnance Survey Map, with the sanction of the Controller of H.M. Stationery Office.

it no longer paid to dig for flint. Thus *a priori* one would expect flint-mining to have been carried on in the early Bronze Age while that metal was still scarce.

(6) Pottery which was found in the mines at Cissbury and at Grime's Graves (Norfolk) is of a type which has recently been recognised as neolithic, for it is found in the rather rare neolithic settlements such as those at Whitehawk Camp (Brighton) and the earliest camp at the Trundle (Goodwood).*

The above considerations provide a good example of the way in which relative dates are arrived at for prehistoric remains. It is rather like a jig-saw puzzle in some respects, where various lines of evidence from many sources have to be compared and fitted until the complete picture appears.

By way of recapitulation we may now draw a picture of the miners and their times. The men were short, dark and long-headed. They possessed pottery, wore woven garments and practised agriculture in which corn had a place. They worked the mines with picks from deer's antlers, shovels made from the shoulder-blades of oxen, and wedges and choppers of flint made on the spot. They kept oxen, pigs and sheep, and hunted red deer. The charcoal of their fires tells us that the local trees included willow, ash, beech and gorse. From the land-shells we learn that the climate was even wetter then than it is now, a fact which is in consonance with what is known of it from other sources. Though the comforts of life were probably few, yet trade was well organised, and the carefully chipped flint tools which they manufactured were bartered about the country, the recipient of each axe being expected, apparently, to grind and polish it for himself. That such an industry could have been carried on at all argues a peaceful, settled, and more or less organised state of society. None of

* See Chap. IV.

the mines are defended by earthworks ; the ramparts at Cissbury, which enclose most, but not all, of the mines on that hill, belong to a much later period, as will be seen hereafter, and have nothing to do with the mines themselves.

Before leaving the subject it may be worth while to recall that there are flint-mines actually being worked at the present day at Brandon in Suffolk, a couple of miles or so from the ancient mines at Grime's Graves. The flint is extracted for the purpose of making gun-flints for export to the natives of remote parts of Africa, and these gun-flints are shaped in the vicinity by knappers who are extraordinarily expert, the local trade having been passed down from father to son for many centuries.*

SUSSEX EXAMPLES AND BIBLIOGRAPHY

The following details regarding the situation and bibliography of the Sussex flint-mines will be of use to students :

1. CISSBURY, 4 miles north of Worthing ; 6 in. O.S., sheet 64, N.W. The mines occupy the western part of the area enclosed by the ramparts of the ' Camp ' (Plate XIII). Excavations, etc., described by : Col. Lane Fox (Lt.-Gen. Pitt Rivers), *Archæologia*, XLII, p. 53 ; E. H. Willett, *Archæologia*, XLV, p. 337 ; Col. Lane Fox, *Journ. R. Anthrop. Inst.*, V (1876), p. 357 ; Prof. G. Rolleston, *Journ. R. Anthrop. Inst.*, VI, p. 20 ; J. Park Harrison, *Journ. R. Anthrop. Inst.*, VI, pp. 263, 431 ; VII, p. 412.
   Travel by bus to Findon, and walk by Nepcote Green, 1½ miles each way ; or walk from Offington Park by Broadwater Golf Links, about 1¾ miles each way.
2. BLACKPATCH HILL, Clapham and Patching parishes, 5 miles N.W. of Worthing ; 6 in. O.S., 50, S.E. The mines are situated ¼ mile N.E. of Myrtlegrove House, adjacent to greenway on its west side. One shaft exca-

* See *Blackwood's Magazine*, Vol. CCXXI (Apr. 1927), pp. 525-534. Specimens illustrating this craft may be seen at the Geological Museum, Jermyn Street, S.W. 1.

vated by Mr. J. H. Pull and the Worthing Archæological Society in 1922, described in *Sussex Arch. Coll.*, LXV, pp. 69-111. Subsequent excavations by Mr. J. H. Pull not yet recorded.

Travel by bus to Findon, and walk westwards from Gun Inn, 2 miles each way.

3. Harrow Hill, Angmering parish, 6 miles N.W. of Worthing ; 6 in. O.S., 50, S.E. The mines occupy the N.E. face of the summit of the hill (Plate I). One shaft excavated by Worthing Archæological Society in 1924-5, and described in *Sussex Arch. Coll.*, LXVII, pp. 103-148.

   Travel by bus to Findon, and walk westwards from Gun Inn, past Blackpatch flint-mines, 3 miles; or bus to Storrington, and walk south over Downs, 3 miles.

4. Church Hill, Findon parish ; 6 in. O.S., 64, N.W. The mines are situated near the top of the hill, about 1000 ft. S.W. of Findon Church. Not yet excavated. Described in *Sussex Notes and Queries*, I, pp. 222-4.

   Walk about 1-1¼ miles from Gun Inn, Findon.

5. Tolmere Pond, Findon parish ; 6 in. O.S., 51, S.W. The mines are situated adjoining the east side of the main road at its highest part, ¾ mile W. of the Gun Inn, Findon. The pits encroach on a pre-existing road, a variant of the present Drove Road. Tentative excavation, 1927. Described in *Sussex Notes and Queries*, I, pp. 168-170.

6. Stoke Down, West Stoke parish, 3½ miles N.W. of Chichester ; 6 in. O.S., 48, S.W. The mines are situated just N. of the clump of trees. Shafts excavated by Major Wade, and described in *Proc. Prehist. Soc. East Anglia*, IV, p. 113.

   Travel by Chichester-Midhurst bus to Mid Lavant, and walk by West Stoke, about 3 miles.

7. Bow Hill, 4½ miles N.W. of Chichester ; 6 in. O.S., 48, N.W. The mines are situated on S.E. spur of the hill. Not yet excavated. The pits encroach on a pre-existing road (*Sussex Notes and Queries*, II, p. 80).

   Travel by Chichester-Midhurst bus to Binderton House, and walk by Welldown Farm, westwards, about 2 miles.

LAMBETH PALACE LIBRARY

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PLATE VI

FLINT IMPLEMENTS FROM THE BLACKPATCH FLINT MINE, NEAR WORTHING.

8. Lavant Caves, East Lavant, nr. Chichester ; 6 in. O.S., 48, S.E. The great probability is that these caves in the chalk were originally the galleries of neolithic flint-mines which were subsequently discovered and used in Roman and later times for other purposes. See *S.A.C.*, LVIII, pp. 68-74 ; *Sussex Notes and Queries*, II, p. 81.
9. Windover Hill, Wilmington parish, 5 miles N.W. of Eastbourne ; 6 in. O.S., 68, S.E. The suspected mines form a characteristic series of mounds and pits on the crest of the escarpment above and slightly to the east of the head of the figure of the ' Long Man.' Described in *Sussex Arch. Coll.*, LXIX, pp. 95-7.

   Travel by Eastbourne-Lewes bus to Wilmington, and walk about 1-1¼ mile each way, involving a climb of about 500 ft.

Further bibliographical references to English and foreign flint-mines will be found in *Sussex Arch. Coll.*, LXV, pp. 110, 111.

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Flints, an Illustrated Manual of the Stone Age for Beginners (British Museum, 1926, 6d.).

Guide to the Antiquities of the Stone Age (British Museum).

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Sir John Evans, *Ancient Stone Implements*.

Proc. Prehistoric Soc. of East Anglia, appearing annually.

Chapter III

THE BURIAL MOUNDS

> The mighty that are fallen . . . are gone down to Sheol with their weapons of war, and have laid their swords under their heads . . . for they were the terror of the mighty in the land of the living.
>
> —Ezekiel.

It has been well said by a leading archæologist of our time that by a curious paradox it is from the graves of the dead that we obtain most of the raw material for reconstructing their lives. If there was no sanctity attached to the homes of the living to preserve them from destruction, it was otherwise with the dwellings of the dead, for it was the habit of these early peoples to bury on the tops of the hills and beside their roads, and to raise over them great mounds of earth or chalk, called 'barrows' or 'tumuli,' that would be conspicuous objects to perpetuate their memory, and memorials not easily destroyed or forgotten.

During the neolithic period, or at any rate part of it, the mighty dead were buried in long mounds of earth and chalk, sometimes as much as 340 ft. long, generally with a ditch along each side but not usually at the ends of the mound (Plate VII). These 'long barrows,' as they are called, are most frequently orientated more or less east and west, and often the east end is the broader and higher of the two. In districts where stone is found locally the body was commonly placed in a chamber constructed of large

slabs of stone built on the ground level, and then the mound was raised over this. In Sussex, however, we should not expect to find such chambers for want of suitable material. Only eight examples of long barrows are known to exist in this county, and none of them has yet been scientifically excavated, though most of them have suffered more or less at the hands of plunderers. Judging, however, from the experience of long barrows explored in other counties, we should not expect to find articles buried with the dead, as was the common practice of the Bronze Age, except perhaps one or two beautifully chipped, leaf-shaped arrowheads of flint, but seldom more. We should simply expect to find one or more unburnt skeletons belonging to the long-headed Iberian type of man, for cremation was not practised till the Bronze Age. By the term ' long-headed ' is meant an individual the breadth of whose skull is less than 75 per cent. of the length, and it has already been pointed out that skulls of this type are characteristic of the neolithic people of Britain, though the same type has persisted down to the present day. In contrast to these we find that in the Bronze Age the prevailing type of skull was ' round-headed,' that is to say, the breadth was at least 80 per cent. of the length.

The distribution of long barrows in Sussex is curious, for they occur in two groups, a larger group of six distributed between Lewes and Eastbourne, and a smaller group of two on one hill near Chichester. Details of these will be found at the end of the chapter.

With the coming of the round-headed folk in whose time bronze first began to be used, we find a complete revolution in methods of burial. Not only were the barrows circular in plan, but the dead were generally cremated and their ashes interred in urns made of crude pottery, frequently accompanied by weapons,

ornaments, and the like, intended to serve them in the next life.

The points of contrast between long and round barrows may thus be summarised in tabular form, though it must be remembered that there are many exceptions to the general rule :

	Long Barrows.	Round Barrows.
Ground-plan :	Elongated.	Circular.
People :	Long skulls, dark complexion.	Round skulls, fair complexion.
Method of disposal of body :	Inhumation (i.e. simple burial).	Cremation (or inhumation).
Original interment :	On original ground level.	Below original ground level.
Grave furniture :	Generally absent.	Frequently present.

The forms assumed by round barrows may be many and various, the one feature common to all being their circular plan. Thus, such a barrow may be a simple mound like an inverted bowl, with or without a ditch surrounding it.* One variety of these, called from its shape a ' bell-barrow,' has a narrow ledge of natural ground-surface between the mound and the ditch (Plate VIII, 1 and 2). This type belongs to the early part of the Bronze Age. In another kind we have a flat, circular, raised platform of earth surrounded by a ditch ; this is called a ' platform-barrow,' and is also early. Yet another form consists simply of a piece of level ground, about 150 ft. in diameter, encircled by a ditch and bank, the latter being either inside or outside of the former. These ' disc-barrows,' as they are called, are always found to contain cremated burials in or near the centre of the circle. Judging from the objects buried with the dead, these are believed to have been the graves of women—the queens and princesses of a forgotten age.

* A ditch may be discovered on excavation, though no sign be present on the surface.

Ordnance Survey Air Photo]
[*By permission of the Controller of H.M. Stationery Office*

PLATE VII

THE HUNTER'S BURGH.

A 'long barrow' on Wilmington Hill, near Eastbourne.

Their date falls between 1400 and 1200 B.C., as determined by the occurrence of Egyptian beads in twenty-five instances.

While the significance of many forms is not understood, it must be remembered that all round barrows do not belong to the Bronze Age. Some of the smaller specimens have proved to be Celtic or Romano-British, and it is probable that others may have been reared by pagan Saxons to bury their own dead which were slain in the long years of fighting with the Britons. In these later barrows cremation was the rule until the advent of the Saxons, when inhumation once more became general, though Saxon cremations are occasionally found, generally in the case of children.

It should be remembered, too, that we know nothing of the manner or place of burial of the bulk of the people in Bronze Age times, for it was only the great men and ladies of those days who received elaborate funerals, and memorials which have remained to this day.

Round barrows of one sort or another are among the commonest antiquities on the Downs, and are to be found almost everywhere along the ridges and on the crests of the hills. Nevertheless, Sussex is not so rich in barrows as is Wessex, and she is particularly unfortunate in possessing very few written records of excavations that have been carried out in them in the past. Probably the great majority of our burial mounds have been plundered by treasure-seekers without any record having been kept of their contents.

A very good example of a Bronze Age barrow used to exist in Hove, and a short description of it and its contents will serve very well to illustrate the type. This barrow was 15 to 20 ft. high, and was situated in what is now a private garden at the back of No. 13 Palmeira Avenue, Hove. In the days when the village of Hove was separated from the neighbouring

town of Brighton by open country this artificial mound was the scene, every Good Friday, of village games and sports, such as 'Kiss in the ring.' It was a common custom during the Middle Ages, and later, for games to be played on Palm Sunday and Good Friday on barrows or within circles of upright stones —a custom which had its origin in ceremonial observances dating from pagan times; and it is probable that these games at Hove were originally connected with a spring festival in honour of the Saxon goddess Eostre.

Unfortunately, in the middle of last century, there were no benevolent societies bent on preserving these interesting relics of the past when they stood in the way of the march of Progress, and so we find that by 1857 this barrow was completely destroyed when building operations were active in the neighbourhood.

At a depth of 9 ft. below the surface, on stiff clay, the workmen came upon a rude oak coffin, hollowed out of a single tree-trunk, and shaped with an axe. It was 6 or 7 ft. long, and had been placed roughly east and west. In this coffin, which crumbled to pieces, were found many fragments of decayed bones, but it could not be determined with certainty whether the body had been cremated or not.

In the centre of the coffin, as if they had rested on the breast of the body, were found four objects, viz., a cup of red amber, a polished stone axe-head, an object shaped like a small whetstone, and a bronze dagger (Plate IX).

(1) The amber cup is all but unique, and is the most prized possession in the Brighton Museum. It is hemispherical in shape and would hold about half a pint of water. It has a handle on one side, and the only decoration is a band of raised lines below the out-curved lip. This vessel has a smooth surface and is made from a single piece of amber. It was evidently

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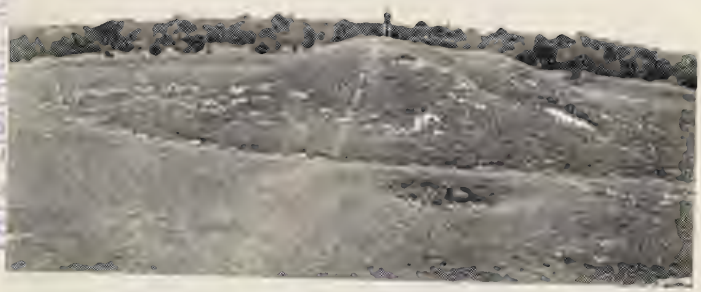


Photograph] [*Royal Air Force Official : Crown Copyright Reserved*

PLATE VIII

1. A 'Bell-Barrow' on Bow Hill, near Chichester.
2. The Bow Hill Barrows from the Air.

turned on a pole-lathe—a type of lathe designed to leave a segment of the circumference untouched by the tool, so as to leave room for a projecting handle.

Only one other amber cup has been found in Britain, and that came from the Clandown Barrow, near Dorchester. Cups of similar shape to this, but made of shale or Kimmeridge clay, have been found in the south-west of England.

The origin of the Hove cup has been debated, but the prevailing view is that it was made in Britain, though of a type that had its origin on the lower Elbe or in the Cimbric peninsula. Amber is found most abundantly on the coasts of the Baltic, but it has also been thrown up by the sea in quantities on our eastern shores from Aberdeenshire to Deal, and this supply was augmented, as Strabo tells us, by importation from Gaul. The use of the lathe, too, was known in very early times, for the discs of stratified shale erroneously called ' Kimmeridge coal money,' found in parts of Dorset where the Kimmeridge clay outcrops, have been shown to be actually the refuse of prehistoric lathe workings.

(2) The axe-head is of beautifully polished volcanic stone, and has a hole through the centre for hafting, and a convex cutting edge at each end. It thus bears a striking resemblance to a Canadian canoe together with its reflection when floating in the water. Such perforated double axes have been found in barrows of the Bronze Age in Wiltshire, Gloucestershire, Yorkshire, and elsewhere.

(3) The object resembling a small whetstone in shape is of smooth stone, $2\frac{1}{2}$ in. long, and is perforated towards one end for suspension. Such stones have often been found associated with bronze daggers, especially in Wiltshire and Ireland, and a very fine specimen was obtained from one of the four large barrows on Bow Hill, near Chichester.

(4) The bronze dagger is of a type common in Wiltshire, with two rivets, and the remains of a bone handle.

The method by which a provisional date is arrived at for the Hove barrow is somewhat as follows: According to the Danish archæologist, Dr. Montelius, the double-edged axe and the bronze dagger are both characteristic of the second period of the Bronze Age in Sweden. In Denmark, a wooden cup, closely resembling the Hove cup, has been found in association with a bronze dagger; the inference, therefore, is that the Hove amber cup also belongs to this period.

In Britain, objects characteristic of this period, such as the flat bronze dagger with rivets, have been found in barrows associated with segmented beads and quoit-like pendants of faience, or Egyptian porcelain, belonging to the eighteenth and nineteenth dynasties (1587-1203 B.C.). It is therefore possible to assign to the second period of the Bronze Age a provisional date of roughly 1500-1150 B.C.

If this line of argument is correct—and there seems to be no good reason for doubting it—we must realise that the Hove tumulus, and the others like it on the Downs, were reared about the same time as the events recorded in the Books of Exodus to Judges.

It will be gathered from what has been said above that, speaking generally, the largest barrows are the earliest. The reason for this seems to be that the large barrows of the Bronze Age were constructed over the remains of great chiefs and heroes, and that as time went on fewer new mounds were raised over individuals, with an increasing habit of burying the dead in tumuli that already existed. Such additional burials are called secondary interments, as distinguished from the primary or original interment. The reason for this is that, as Mr. Hadrian Allcroft has well shown, a circular area was considered conse-

crated ground because the circle was to these ancient people the symbol of sanctity and eternity. The idea has survived in the magic circle of the medieval necromancer. Such a circular mound containing the venerated remains of some ancient hero, now regarded as a demi-god, was doubly sacred, and was regarded as the most suitable place for the disposal of the dead of succeeding generations.

Thus with the increase of secondary interments and the decay of the habit of raising fresh barrows we get gradually developed the idea of the cemetery, which consists solely of ' secondary ' interments, the primary or original burial being either omitted or, more probably, represented by real or supposed relics of some great hero or demi-god.

Customs, especially burial customs, die hard, and this one has survived in full vigour to our own day, for the parish churchyard is really the representative of the ancient barrow now become a cemetery, all the interments therein being of the nature of secondary burials, while the original primary interment is represented by the ' dedication ' of the church to one of the saints—the demi-gods of medieval Christianity. We see, therefore, whence comes the idea of consecrated ground for burial, a conception which, like that of canonised saints, is entirely foreign to the Christianity of the New Testament. It is true that the circle as an emblem has long been forgotten and has given place to the cross, but the sanctity which it conferred remains with us, and strange to say, the ' consecrated ground ' has come to be regarded as the essential feature of Christian burial!

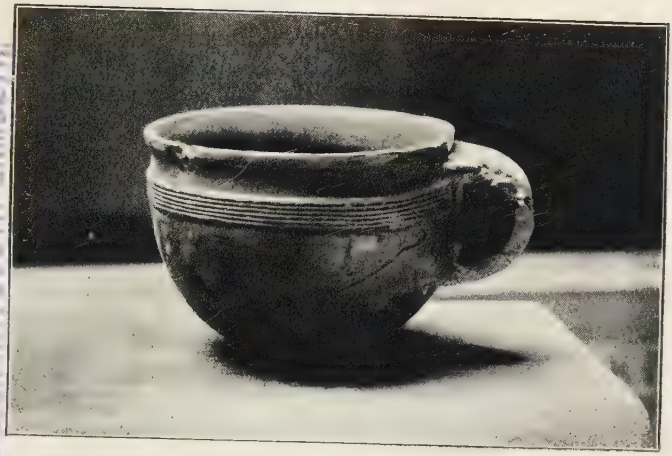
The sanctity of the ancient barrow led to other uses besides that of secondary burials. The functions of religion, justice and commerce demanded the protection of the spirits of the mighty dead against perversion by evil-doers, and so the sacred circle—actually so called by Homer in this connection—the

home, it may be, of the spirit of the local hero, was naturally chosen as the place of meeting for religious, judicial and commercial activities.

At different times and in different ways these functions came to be separated. In the Early Iron Age, and especially during the Roman occupation, we find a specialised kind of barrow being built, not for burial, but for the accommodation of gatherings of people, and shaped like a small turf amphitheatre. In most cases the ' dedication ' representing the primary interment in such a specialised barrow, or *Circus*, as the Romans called it, would be symbolical rather than real. In this sacred place were held, not only courts of justice and markets, but religious ceremonies, including games and gatherings for the transaction of all the business of the community. The Good Friday sports that used to be held on the Hove tumulus are probably a relic of these games, dating from the days before the differentiation of the Circus.

Originally these functions had to be carried on in the open air, but among the English, who seem to have had similar customs, and under the influence of Christianity in particular, the weakness of the flesh prevailed, and buildings came to be erected within the sacred enclosure to protect those who gathered together from the inclemency of the weather. Thus we find that even as late as the Middle Ages the parish church served the conjoint purpose of religion, justice, commerce and communal business, though the religious plays and games were often, for convenience, carried on in the open air.

It is very probable that the words ' church,' ' kirk,' and the kindred words in other languages, owe at least part of their origin to the Latin *circus*, which was the name applied in the Roman Empire to those structures which in pre-Christian times fulfilled the same functions as did the parish churches



[*By kind permission of the Director of the Brighton Museum*

PLATE IX

OBJECTS FOUND IN THE HOVE TUMULUS

Viz. : Amber Cup, perforated Stone Axe, Whetstone, and flat Bronze Dagger.

of the Middle Ages. When one studies the formidable array of evidence, both classical and archæological, produced by Mr. Allcroft, one is irresistibly led to this conclusion in spite of the traditional derivation from the Greek words *kuriakē oikia*, meaning ' house of the Lord.' Just as we have seen that the ' dedication ' to the saint properly belongs, not to the church building, but to the churchyard, so it would seem natural that the term ' church ' refers strictly and originally to the sacred enclosure, and not merely to the building within it.

The idea of the Circus, which was by no means confined to Britain, developed along other lines as well. The secularisation of the religious games and shows, and their production on a larger scale, led to the evolution of the Greek and Roman theatres. This involved little more than an increase in the size of the village Circus, together with its construction in stone instead of earth, and the elaboration of details. Even in Britain a regular sequence in point of size can be traced from the little Circus of the Romano-British village to the amphitheatre of the Roman town, the size of the structure depending simply on that of the community for which it was built.

Throughout the Roman Empire the existence of a Circus was the outward and visible sign of a self-governing community, whether village or town. King Alfred says that in his day they were innumerable, but comparatively few have survived the all-levelling plough or the local farmer's temptation to convert them into ponds, for which they often seem specially suited.

The earthen Circus was to the villages of the chalk hills what the so-called ' Druid's Circle ' was to those of the stone-bearing districts of the west and north of Britain. Just as the Circus was developed from the barrow, so the large stone circle was developed from the ' sepulchral circle,' that is, a small circle of

stones erected round a grave. In the centre of the barrow and of the sepulchral circle was a pit in which the remains of the dead were buried below the level of the ground. In some of the Circi and stone circles this pit was retained, not as a grave, but as a kind of altar into which votive offerings might be thrown in honour of the deity or demi-god to whom the circle was sacred. Traces of such a rite have been found in two Circi in Sussex, but details will be deferred to another chapter in which the whole adjacent settlements will be described.

These considerations illustrate very well the development of man's ideas, and when we contemplate one of the ancient barrows on the Downs, we shall think of it, not merely as a heap of earth containing, perhaps, an old crock or some mouldering bones, not merely as the grave of some hero who flourished in the days of Joshua or Samson, but as the germ from which has sprung our parish churches, our parliament, our markets and playing-fields, and much else of custom and tradition which go to make up our England.

SUSSEX EXAMPLES AND BIBLIOGRAPHY

Long Barrows (*Neolithic Period*) :

1. Cliffe Hill, Lewes ; 6 in. O.S., 54, S.W.
2. ' Money Burgh,' Deans, nr. Piddinghoe ; 6 in. O.S., 67, S.W.
3. Firle Beacon, West Firle parish ; 6 in. O.S., 67, S.E.
4. ' Long Burgh,' Alfriston parish ; 6 in. O.S., 68, S.W.
5. ' Long Mound,' Windover Hill, Wilmington ; 6 in. O.S., 68, S.E.

   Nos. 1-5 above are described by Mr. H. S. Toms in *Sussex Arch. Coll.*, LXIII, pp. 157-165.

6. ' Hunter's Burgh,' Wilmington Hill ; 6 in. O.S., 68, S.E. Described in *Sussex Arch. Coll.*, LXIX, p. 93.

7, 8. Stoughton Down, Stoughton parish (2 specimens) ; 6 in. O.S., 48, N.W. Described in *Sussex Arch. Coll.*, LXVI, pp. 172-5.

Round Barrows (*Bronze Age and later*) : These are common in all parts of the Downs, many being indicated on the 1 in. O.S. maps, but specially fine examples are to be seen in the following places :

1. Bow Hill, 5 miles N.W. of Chichester ; 6 in. O.S., 48, N.W. Four large bell-shaped barrows surrounded by ditches, described in *Arch. Journ.*, X, p. 356. *See Plate VIII.*
2. ' The Devil's Jumps,' Treyford Hill, Treyford parish ; 6 in. O.S., 34, N.W. Five large bell-shaped barrows with ditches, similar to the foregoing.
3. Heyshott Down, Heyshott parish (close to boundary of Graffham parish) ; 6 in. O.S., 35, S.W. A group of eight barrows of various kinds—' ring,' ' bowl,' and ' bell '—with other earthworks, described in *Sussex Arch. Coll.*, LIX, pp. 47-8, with plan.
4. Lewes Race Hill, about 350 yds. N. of Floods Barn, beside Lewes-London road ; 6 in. O.S., 54, S.W. A group of barrows including a remarkably fine ' platform ' barrow.
5. Teg Down, near Brighton ; a large ' disc ' barrow ; 6 in. O.S., 53, S.W., situated on the S. side of the dry pond.

Circi (*Romano-British*) :

1. Buckland Bank, Falmer parish ; 6 in. O.S., 53, S.E. Excavated, and described in *Brighton and Hove Archæologist*, II, pp. 29-40 ; III, pp. 62-74, and plate. (These references are important : in the former Mr. Hadrian Allcroft describes clearly and concisely the origin and uses of the Circus.) See also *Sussex Arch. Coll.*, LXIV, pp. 35-40.
2. Park Brow, Sompting parish ; 6 in. O.S., 51, S.E. This specimen has been controverted, and appears to have been originally a water-hole afterwards converted into a Circus. Differing views appear in *Sussex Arch. Coll.*, LXIV, pp. 32-54 ; LXV, pp. 242-250 ; LXVI, p. 170. *See also Chap. V.*
3. Under east side of Bow Hill, near Dean Cottages, Binderton parish ; 6 in. O.S., 48, N.W. Excavated, and described in *Sussex Arch. Coll.*, LXVI, pp. 163-171.

Cemeteries :

1. Buckland Bank, Falmer parish ; 6 in. O.S., 51, S.E. Romano-British. Circular ; site still marked by ring of bracken-fern near head of valley (' Buckland Hole '). Burials mostly in southern half. Destroyed by flint-diggers in 1849. Urns in Lewes Museum. Described in *Sussex Arch. Coll.*, XVIII, pp. 65, 67, LXIV, pp. 38-40.
2. Hassocks, Stonepound sand-pit ; 6 in. O.S., 39, S.W. Romano-Belgic, with a few middle Bronze Age urns, and a few Saxon cremations. Described in *Sussex Arch. Coll.*, LXVI, pp. 34-61. Urns in Lewes Museum.
3. Seaford, $\frac{1}{3}$ mile N. of the Camp on Seaford Head ; 6 in. O.S., 79, S.W. Roman, 2nd century. Described in *Sussex Arch. Coll.*, XXXII, p. 167.

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5. C. Warne, *Ancient Dorset*.
6. J. Douglas, *Nenia Britannica*.

Circi and Kindred Subjects :

A. Hadrian Allcroft, " The Circle and the Cross," appearing seriatim in *Arch. Journ.*, LXXVII, and succeeding volumes, and now published as a separate book (Macmillan, 1927).

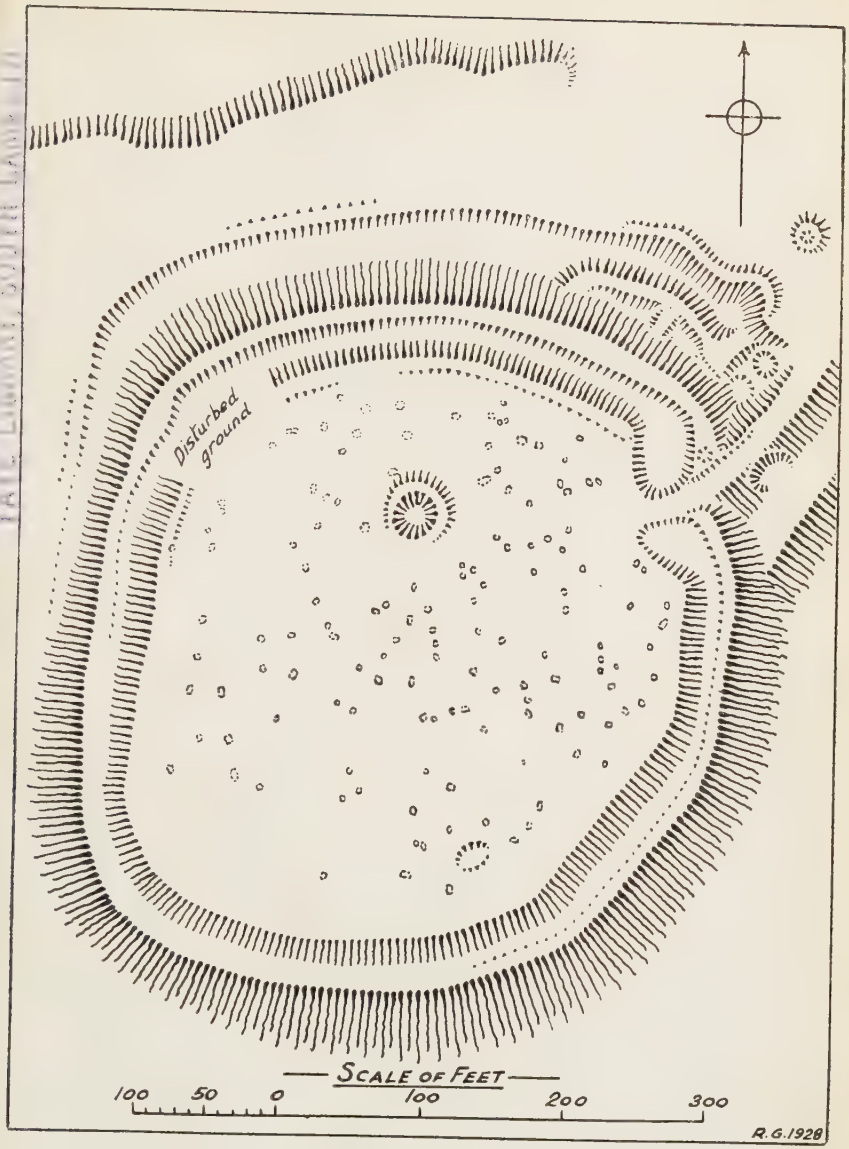

PLATE X

PLAN OF THE CABURN

Showing the positions of the rubbish-pits and store-pits. Dating from 400 B.C. to 100 A.D.

From a survey by E. C. C. and G. L. C.

Chapter IV

THE HILL-FORTS

Iam seges est ubi Troia fuit.
—Ovid.

The summits of many of the prominent hills on the Downs are encircled by an earthen rampart and ditch. In the older editions of the maps they are sometimes marked as ' Roman Camps,' for no other reason than that the antiquaries of a past generation attributed most things ancient to the Romans, and, assuming that the ramparts in question were of that origin, further assumed that they formed defensive places where the legionaries ' camped.' We are now slowly getting rid of the epithet ' Roman ' in this connection (though old beliefs die hard), but the term ' camp,' perhaps equally erroneous, seems to have come to stay.

Unfortunately we know as yet only too little about this type of earthwork in our county. Of the twenty-three examples in the Downland area only four—namely, Cissbury, the Caburn, the Trundle, and Whitehawk—have been investigated to an extent sufficient to throw light on their history. Of the eighteen remaining almost nothing is known beyond what one may infer from analogy.*

Taken generally it is safe to say that in most cases these so-called Camps were built for defence. This is shown, among other things, by the frequency with which the names end in *-bury,* as in Chanctonbury,

* Since the first edition appeared, two more Camps, Wolstonbury and Thundersbarrow, have been dated by the spade (see pp. 68-69). Saxonbury (p. 72) should also be included.

Cissbury, Wolstonbury, and Hollingbury, for this termination is derived from an old English word meaning 'at the fortress.' But in some cases the ramparts are so small at the present day that it is difficult to see how they can ever have served to keep out a determined enemy. The levelling powers of time and the plough must, however, be remembered, and were such ramparts restored to their original condition we should be surprised to see what formidable obstacles they would present.

The majority of hill-forts that have been investigated elsewhere in the south of England have proved to belong to the Early Iron Age, i.e. between 500 B.C. and A.D. 50. Apparently that was the principal era for the building of these fortresses, though, as will be seen, forts of a very special kind were constructed some 2,000 years earlier, towards the close of the neolithic period.

Prehistoric camps have been divided into two main groups, namely, (1) those in which the ramparts follow the contour of the hill-top, such as Cissbury, the Trundle and the Caburn ; and (2) those which are situated, like the Devil's Dyke, on spurs or promontories of the Downs, and depend for artificial defence chiefly on a strong rampart thrown across the neck of the promontory. There is no evidence that these two types are of essentially different dates when they are found on the tops of the highest hills. There is, however, a type of promontory fort which is found on low eminences close to a river or the sea, as at Burpham, Lewes and Hastings, and there is definite evidence that these specific examples were constructed by the Saxons.

Four of the camps on the chalk Downs are more or less rectangular, namely, those on Highdown Hill, Harrow Hill, Bow Hill, and Beacon Hill (Harting). Unlike the 'contour-forts,' these do not enclose the whole hill-top. They are too irregular to be Roman,

and the Romans did not choose the summits of hills as their predecessors did. It is known, however, that in certain parts of Germany rectangular camps were constructed in the Early Iron Age.

We may now consider in detail the Camp on Mount Caburn, near Lewes, which has been excavated, and regarding it as an example of its kind, we may learn from it a good deal about the life of the people who lived there.

The Caburn

The Camp, which is known locally as *The* Caburn, consists of a rampart and ditch encircling the dome-shaped summit of the hill, and enclosing a space of only about $3\frac{1}{2}$ acres (Plate X). The hill falls very steeply to the east, south and west, but the approaches are easy on the north and north-west, consequently the ramparts are reduplicated on those sides to give greater security. The only entrance opens to the north-east, and is so situated that those who approach it must present the right or undefended side to the defenders, for the shield was carried on the left arm. On the northern part of the interior of the Camp is a large pit with a bank round it. The rest of the area enclosed by the ramparts is dimpled all over with slight depressions, about 140 in number, where the grass is growing greener and the earth rings hollower to the tread.

In 1877 and 1878 Lt.-Gen. Pitt Rivers, the great pioneer of scientific archæology, opened the large pit and forty of the little ones, and cut sections through the northern ramparts. He found that the latter had carried a stockade, of which he discovered the post-holes, and he also found that the fragments of pottery lying on the original surface of the hill under the inner rampart were of an older type than those lying under the outer. This shows that the latter was an addition thrown up at a later time to strengthen the

defences. The large pit he found to be 12 ft. deep, and he concluded that it was probably a water-hole, for it had a runnel on one side to feed it with surface water.

It fell to the lot of the writer, together with some friends, to carry on the excavation where Pitt Rivers left it, and to open the remaining ninety-nine pits on the hill. This consisted in clearing out the earth and chalk with which they were filled, and in searching carefully through every spadeful for little insignificant relics of human occupation. The pits themselves were small—too small for dwelling-pits ; they were in all probability store-pits and refuse-holes, and the inference is that the inhabitants had lived in huts above ground, and that these pits had been situated under or between the huts. Of the latter no trace survives, except some pieces of unbaked clay bearing the characteristic impression of wattles, or hurdle-work, on which the clay had been daubed to form the walls.

As found, the pits were full of earth and chalk and ashes, in which one might find any of the apparently worthless things that one would expect to find in a rubbish-heap. But trivial as these may appear, they all have a story to tell, as will be seen.

How fascinatingly human it all is! How blind are those who can see in these relics nothing more than musty old rubbish! Every one of the common little objects of everyday life has a tale to tell of human beings who had just the same affections, hopes, and fears as ourselves, and who were just as weak and just as human. There is no need to seek for works of art, the expressions of exceptional genius. Far more touching are the commonplace trifles of humdrum life—the things handled, even loved, by humble folk like ourselves.

Blocks of chalk weighing from 2 to 6 lb. and perforated at one end for suspension, were found in

PLATE XI
OBJECTS FOUND IN THE CABURN.

several pits (Plate XII, 48, 49). These are known to have been used in the old upright looms for attachment to the ' warp ' to maintain the tension of the threads. Thus we learn that weaving was practised here, and this is confirmed by the finding of the remains of a weaving-comb made of deer's antler, with which the ' woof ' was driven home. Spinning, too, was done with spindle and distaff, as it was in some parts of the Highlands until recent times, for we have the ' whorls '—perforated discs or balls of chalk, clay or sandstone, which were fitted on to the lower end of the spindle to act as a kind of fly-wheel to make it spin round (Plate XI, 10).

Iron and bronze were probably smelted, for some of the refuse metal was found, and also broken crucibles. Among the iron objects found in various pits were a sword (11*), a dagger (14), a razor (19), some knife-blades, a plough-point (15), a sickle (13), a billhook (12), a hammer (16), a safety-pin or fibula (20), and part of a latch-lifter of Celtic type. Antlers of red deer were sawn up with metal saws, for the manufacture of various objects such as weaving-combs, knife-handles, and the like (21).

Other objects found include a beautiful and well-preserved bronze brooch (4), a finger-ring (31), a blue glass bead, a clay sling-bullet such as Cæsar describes the Gauls as having used (46), and several hundred selected beach-pebbles collected for use as sling-stones.

A lead weight weighing almost a sixteenth part of the Celtic ' pound ' is probably the forerunner of our avoirdupois ounce, though the Celtic ' ounce ' and ' pound ' were considerably lighter in weight than ours. Just as, however, the division of our Apothecaries' pound into 12 ounces of 8 drachms is based on that of the Roman *libra*, so the division of our avoir-

* The numbers in brackets refer to the objects figured in Plates XI and XII.

dupois pound into 16 ounces of 16 drams is probably derived ultimately from that of the Celtic unit which weighed 4,770 grains. A division into sixteen parts implies a more primitive system and standard than a division into twelve.

It may come as a surprise to many to learn that coins were in circulation among the inhabitants of this small hill-city, before the coming of the Romans. Eleven such have been found in the Camp, of a type that was in circulation in Kent and Sussex, probably during the first century before Christ (Plate XI, 1). They have been cast in an alloy of copper with a large percentage of tin, and have been copied from Gaulish copies of a Greek coin of Massilia (Marseilles)—copied so often that the representation of the head of Apollo on one side, and of a horse or bull on the other, is reduced to a merely conventional grouping of lines. A Carthaginian coin of about 200 B.C. was also found in a mole-hill a few yards to the north of the Camp (32). It bears on one side the head of Persephone, and on the other that of a horse, and may be a relic of trade with the Phœnicians, for Carthage was a Phœnician colony.

Four Roman coins were found in one pit at the highest part of the centre of the Camp, and another illegible one in the surface soil covering a neighbouring pit. They belong to the reigns of Julia Mamaea (A.D. 235), Marcus Julius Philippus the Younger (A.D. 247-9), and Constantine the Great (A.D. 306-337), two coins of the last-named bearing the London mint-mark (9). The Latin inscriptions on them include the following: 'Revered Fertility,' 'Revered Victory—by Decree of the Senate,' 'To the Sun, the Unconquered Comrade—London money' (9), and 'Blessed is Tranquillity—London money.'

The commonest relics on the hill were fragments of pottery. It has been possible to recover the original shapes of a few of the vessels, and these display the

PLATE XII

OBJECTS FOUND IN THE CAHUIN

graceful curves and artistic designs characteristic of Celtic workmanship (70-73). It is from the pottery that most can be learned concerning the date at which this settlement flourished—a point which will be discussed below.

An interesting question is raised by the occurrence of a cross rudely scored underneath the bases of several of the vessels—a not uncommon feature in pre-Christian pottery (Plate XI, 168). It occurs most commonly in pottery of the Bronze Age, where it is the most frequent but not the only device so used, and it is rarely found on the vessels of the Roman period. It is difficult to see how this feature can have been in any sense intended as an ornament, for not only is the device placed in a position that is usually hidden from view, but the faintness and, especially in some cases, perfunctory character of the pattern seem to preclude all idea of ornament, and rather to suggest that its motive was superstitious. The cross seems to have been made in every case when the clay was already hard, or nearly so, and to have been scored on with some object like a stick. In some cases a single perfunctory pair of lines at right angles to one another has sufficed. In others in which the clay was harder the effect was produced by repeated rubbing, resulting in burnishing.

It is well known that the cross as a symbol and superstitious emblem goes back to very early pagan times, but it is not always remembered that it was not till the fourth century that it was adopted *as such* in the Christian religion, the reason for such adoption being its resemblance, on the one hand to the initial Greek letter (X) of the name of Christ, and on the other hand to the Roman instrument of crucifixion.

A form of ancient cross common in the Bronze Age, especially in Western Europe, was that which is contained within a circle—the so-called ' wheel-

cross,' because it resembles a wheel with four spokes. The circle is held to have represented the solar disc. This form of ornament or symbol survives to the present day in the so-called Iona crosses, and in some of the haloes depicted in stained-glass windows.

Primitive man is fain to see the symbol of his deity in natural and everyday objects. He hung up a pair of stag's antlers because he saw in them the crescent, the symbol of the moon-god, and expected it to bring him luck, and his professedly Christian descendant, though he has forgotten the origin of the emblem, hangs up a horse-shoe for a similar end. In the common ' Shepherd's Crown ' or fossil sea-urchin with its radiating marks he probably saw a roughly circular object upon which nature had stamped a cross, albeit with five arms instead of four. Mr. H. S. Toms* has drawn attention to the superstitious uses to which these fossils have been put, from the Bronze Age right down to the present day. They are, for instance, supposed to protect buildings and persons from lightning and from the Evil Eye. They are placed in dairies to make the milk give good cream, and they have even been found furnished with metal loops for suspension as amulets. This superstitious regard for a particular fossil seems most likely to have been originally inspired by its shape, representing as it does a kind of cross within a circle. If so, it may throw light on the meaning of the cross so rudely scratched within the circle formed by the bases of so many of the Caburn pots. Like the ' Shepherd's Crown,' it may have been put there in order to induce the milk in the vessel to give good cream, or to protect the contents from witchcraft and the Evil Eye. These things provide food for the thoughtful, and give us pause when we imagine that we are being good Christians when we make the

* *Downland Post*, Sept. 1926, pp. 264, 265.

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PLATE XIII

CISSBURY FROM THE AIR

The western part of the camp, showing the ramparts and the ditches of neolithic flint-mines. In the N.E. corner is a small rectangular earthwork of unknown date and purpose.

'sign of the cross.'* It is a strange phenomenon to observe that with an increasing spirit of rationalism there is a corresponding increase in superstition. It is as if the spiritual side of man's nature, baulked by the one, finds a spurious outlet in the other.

The question as to the period when the Camp was occupied is answered by a consideration of the objects found. The pottery is of types which range from about the fifth century B.C. to the early part of the first century A.D. With the exception of a very few small shards, no Roman pottery was found.

The evidence of the other datable objects agrees with that of the pottery. The sword is of a type belonging to the period 250–100 B.C. The Carthaginian coin discovered in a mole-hill just outside the ramparts (if it can be admitted as evidence) dates from about 200 B.C. The British coins probably belong to the period 100 B.C.–A.D. 50. The bronze brooch is datable to the half-century A.D. 50–100. Apart from the four Roman coins which belong to the third and fourth centuries A.D., nothing has been found later than this brooch, and in the absence of other corroborating evidence these coins must be regarded as intrusions belonging to a later date, along with a penny of George III and medieval and modern clasp-knives and nails.

There is no trace of any occupation of the site during the Bronze or earlier ages. The evidence, therefore, shows that this hill was inhabited from 400 or 500 B.C. until about A.D. 50, or soon after.

'From the nature of the occupations and industries carried on, such as iron-smelting, weaving, and agriculture, it is to be inferred that the site was one of permanent habitation—a small fortified hill-top

* In the museum at Namur in Belgium are two glass bowls from a Frankish cemetery at Samson. Each has the XP (*Chi rho*) monogram stamped on its base, recalling the cruciform marking on the Celtic pot-bases described above. The XP was the earliest form in which the cross, as a symbol, began to be introduced into Christianity.

city—and not merely a camp of refuge in troublous times. Of analogous sites in Palestine, Prof. Macalister says: 'For purposes of defence the cities were as a rule constructed on the hill-tops. Not until the period of Roman domination made internal hostility impossible, and held foreign enemies at bay, did the inhabitants venture to leave the cramped areas within their city walls, and to build more open dwelling-places, close to the local source of water.'* These words might well have been written of the Caburn. Not only does the chronological sequence of the finds cease abruptly at the threshold of the Roman period, just when Roman influence is beginning to appear in native pottery, but the absence of signs of destruction, and, above all, the scarcity of all but the refuse of human habitation, seems to proclaim that the site was peacefully deserted at a time when the *Pax Romana* began to render it unnecessary to live in such a bleak situation for the sake of the protection afforded by encircling ramparts and precipitous hillsides. . . .

'The evidence so far obtained enables us to form a very fair idea of what the site must have been like, say, in the first century before Christ. We must picture the ramparts as crowned with a stockade, while the space enclosed by them was filled with little thatched huts, huddled together, and made of wood or hurdle-work daubed with clay. The doors were fitted with some form of latch requiring a key to unfasten them.

'The people who lived in these huts wore woven woollen garments, shaved their beards, and adorned their persons with glass beads and artistic brooches and rings of bronze. They possessed dogs, horses, and pigs, farmed sheep and cattle on the Downs, and hunted red deer and boars in the great forest

* R. A. S. Macalister. *A Century of Excavation in Palestine* (R.T.S., 1925) pp. 39, 40.

of the Weald. Corn was grown in the neighbourhood, probably in the contemporary fields which are still visible on Cliffe Hill and Saxon Down, and their agricultural implements included ploughs, sickles, and bill-hooks. They bought and sold with money, and weighed their goods according to the accepted standards of the time.

'Within their huts they practised spinning and weaving, smelting, and smithcraft, using knives, saws, hammers, and other tools closely resembling our own. They were well provided with pottery vessels, and did at any rate some of their cooking by means of heated stones.

'While the fear of war evidently existed, we do not learn that the place was ever besieged or sacked.'*

Cissbury

When we turn to Cissbury, we find a great fortress, occupying some sixty acres of ground, or about seventeen times the area of the Caburn (Plates XIII and XIV). It is the largest and most impressive Camp in Sussex, and has attracted the attention of antiquaries and archæologists ever since the days of Camden. Many names have been associated with investigations carried out here, but the little that we know of its history has been obtained chiefly by Lt.-Gen. Pitt Rivers and Mr. H. S. Toms, the former by excavation, and the latter by observation on the surface. The name of Lt.-Gen. Pitt Rivers is one that deserves special honour in that he was the first to apply scientific principles to the study of archæology, his predecessors having been much too easily satisfied with conjectures and assumptions. Mr. Toms, too, deserves great credit for showing how much it is possible to learn simply from surface observations, as a result of patiently exploring every inch of the ground, not once, but countless times,

* *S.A.C.*, LXVIII, pp. 44-6.

carefully noticing every insignificant feature, and drawing therefrom the deductions dictated by common sense.

The great interest of Cissbury lies in the number of features it presents. There are, for instance :

(1) The earthwork surrounding the Camp. This consists of a ditch between two ramparts, the inner being the larger, and a secondary inner ditch along the north-west and north-east sides. The plan of the Camp (pp. 56-7) is an elongated oval, roughly half a mile long, lying north-east and south-west, and the two original entrances are at the east and south. The rampart is also breached by footpaths on the north and south-east, but these are clearly not original features.

(2) Neolithic flint-mines, similar to those described in a previous chapter, are clustered thickly in the western part of the area of the Camp, appearing as numerous grassy pits and mounds, with which the ground is entirely broken up (Plate XIII). The group of mines also extends southwards for some distance *outside* the Camp.

(3) Traces of ancient cultivation, called lynchets, are to be found in the eastern part of the area of the Camp (Plate XIV). These, as will be explained later, are of a type characteristic of the Early Iron Age and Roman periods, and with them are some pit-dwellings which have been found by excavation to belong to the Early Iron Age.

(4) The remains of small rectangular earthwork-enclosures are found by very careful searching in the eastern part of the Camp. Some of these can only be seen when the light of the setting sun throws their low banks into relief, the latter being in some cases only from three to six inches high. Three of these enclosures were partially excavated by Pitt Rivers, with very indefinite results, but it seems probable that the enclosure situated about a furlong

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PLATE XIV

CISSBURY FROM THE AIR

Showing the S.E. ramparts and prehistoric cultivations inside the Camp.

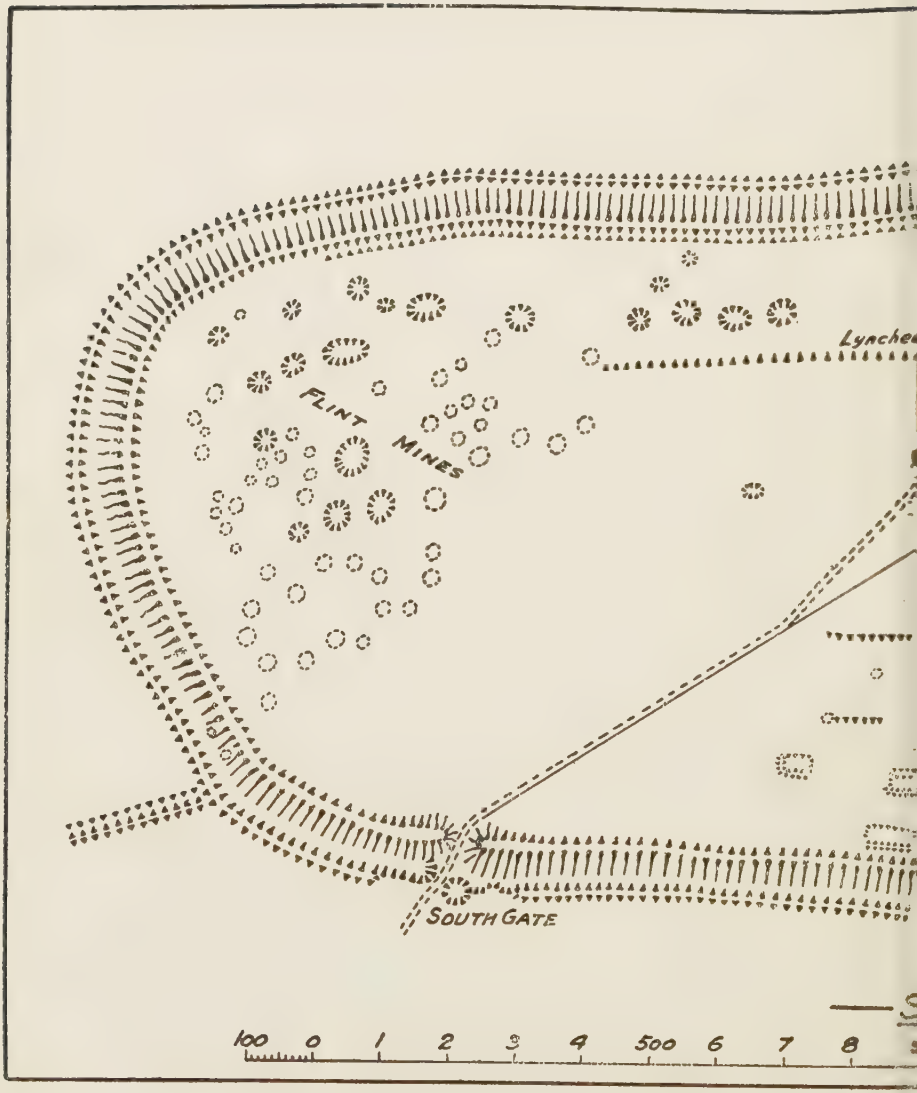
west of the east gate of the Camp marks the site of some occupation during the Roman period. Until further excavation is undertaken, no opinion can be expressed about the remainder, except that one situated immediately within the east gate has been partially destroyed by the refortification of that gate, as will be described presently.

To sum up, therefore, we have neolithic flint-mines, pit-dwellings of the Early Iron Age, enclosures of unknown date (except that one may well be of the Roman period), cultivations of the Early Iron Age or Roman period, and finally the encircling rampart.

The main problem is—when was this rampart constructed, and what is its relation to the flint-mines and cultivations?

Pitt Rivers' excavations clearly proved that the rampart is later than the mines, and was not built to enclose them, for he found that it cuts right through some of the pits at a point a little west of the south gate. His sections through the ditch and rampart of the Camp revealed that when originally dug the bottom of the ditch was some five feet deeper than it is to-day, the difference being due to the accumulation of chalk rubble which has silted down from the ramparts on either side. The experiments which he subsequently conducted in Dorsetshire concerning the silting up of freshly-dug ditches in chalk country make us realise that of these five feet of silt at least half—perhaps more—must have accumulated within a couple of years of the digging of the ditch, while the rest gradually collected at a steadily decreasing rate.

Now Pitt Rivers removed this silt from a section of the ditch in three more or less equal layers, so as to determine what difference there might be in the objects found at different levels. As will be inferred from what is said above with regard to the rate of silting, anything found in the lower half of the



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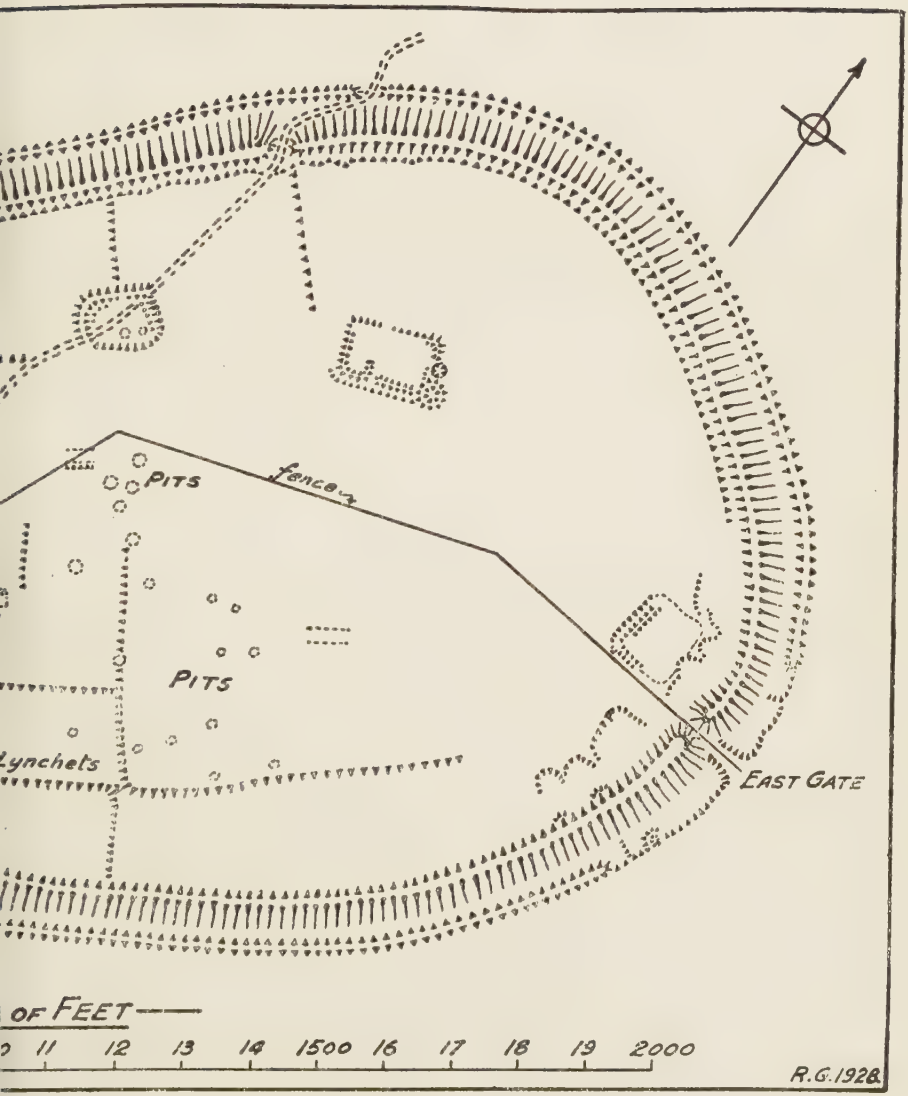


(Many details after H. S. Toms)

filling must be either contemporary with, or older than, the period of the construction of the ditch and rampart. Objects found near the top of the filling may be much later than this period, though, of course, all the material may be pervaded with the relics of the ancient flint mines.

Accordingly, we find that in his uppermost layer Pitt Rivers found, besides animal bones and flint-mining relics, a number of shards of Romano-British pottery, a piece of tile, oyster shells, and large snail shells.

In his second layer he found more oysters and hundreds of snail shells of the varieties known as *Helix aspersa* and *H. nemoralis*.

In the lowest layer were still more oysters, but none of the above-mentioned snails, and in addition a single fragment of thick, coarse pottery containing large grains of quartz in its composition.

Pitt Rivers also dug a trench through the main rampart, in the body of which he found oyster shells and about twenty-five fragments of badly-baked, hand-made pottery, but no Romano-British ware. He found that the rampart had been constructed by first making a pile of turves which had been removed from the ground when beginning to dig the ditch ; over this was a mass of chalk rubble which constituted the main body of the rampart, and which had been derived from the ditch. Finally the bank so formed had been heightened and strengthened by the addition of successive layers of turf and rubble, as many as seven alternate layers being counted at one place.

How does this evidence bear on the question of the date of the rampart and ditch ? The fact that Romano-British pottery was found in the upper part of the silting of the ditch, and not in the lower layers nor in the body of the rampart, would indicate without much doubt that this earthwork was constructed *before* the Roman period, and this would be con-

Photograph] [*Royal Air Force Official : Crown Copyright Reserved*

PLATE XV

THE TRUNDLE, GOODWOOD, FROM THE AIR.

The photograph first drew attention to the faint inner Earthworks which have proved to be neolithic. The outer ramparts are Celtic.

firmed by the finding of pre-Roman pottery in the body of the rampart. This solution of the problem would be in full accord with what little is known of the hill-top Camps of the south of Britain, viz. that they fell into disuse at, or before, the Roman conquest.

On the other hand, the solution does not appear to be quite so easy, for, as Mr. Toms has pointed out, we have little, if any evidence, that oysters and the particular snails alluded to above were eaten in pre-Roman times—in fact, the evidence seems to point in the opposite direction. Most authorities would, however, probably agree in attaching more importance to the evidence of the pottery, though that of the shells is perplexing and calls for more research.

One of the most interesting features that Mr. Toms has shown us about Cissbury is that at some period subsequent to its original construction the ramparts were re-fortified for defence. We have already seen how the main bank had been heightened by successive layers of turves where Pitt Rivers examined it. All round the north and north-western sides of the Camp an inner ditch has been dug to provide material for strengthening that part of the rampart, and this ditch is clearly subsequent to the lynchets or cultivation banks already alluded to, for it encroaches upon them. This is an important point. The two entrances have also been reconditioned by the removal of the ends of the outer rampart on either side of the entrance causeways, with widening of the ditch, and the material thus obtained has been used to increase the height of the main rampart on either side of the actual gate. In the case of the eastern entrance scoop-like depressions may be seen just inside the gate, from which more material has been obtained for the same purpose, and it is important to notice that these scoops have partially destroyed one of the small rectangular earthworks to which allusion has been made above.

With regard to the lynchets inside the Camp, it is, unfortunately, not possible to be quite certain whether they form one continuous series with those in the valley to the south. If this were the case, it would show that they were there before the rampart was thrown up. As we have seen, they were certainly there before it was re-fortified.

One of the strange things about Cissbury is that so far no sign has been found that its interior has been at any time densely or continuously inhabited, as one would expect to find if it had been a city like the Caburn. Nor has any sign been found that the place was ever besieged or sacked. Men of the Stone Age dug and worked their flints on this hill. Others of the Early Iron Age lived there and tilled their fields, and somebody occupied the summit of the hill in Roman times, but who put up the ramparts, and when, and why? And who re-fortified them, and against whom? Pitt Rivers has calculated that it would take a garrison of 5,000 men adequately to man the ramparts. This is the great problem of Cissbury.

Altogether it seems probable that the ' Camp ' was constructed as a place of refuge for the inhabitants of the neighbouring agricultural villages in case of the invasion of their territory by hostile tribes. If this was done shortly before the coming of the Romans the probability is that it was not needed for this purpose till long afterwards, when the waning power of Rome coincided with the increasing activities of Saxon pirates. It has been suggested that the strengthening of the defences began at this time, and continued until the fateful day when the Saxons, no longer raiders but settlers, at length overcame the resistance of the fortress as they pressed eastwards to Anderida.

Comparatively little digging ought to suffice to throw much light on these questions.

The Trundle

It remains for us to consider the great earthen fortress called the Trundle, that is, 'the Hoop,' on St. Roche's Hill, above the Goodwood racecourse. This is in some ways the most interesting camp of all, for an air-photograph (Plate XV) taken in 1925 revealed what had not previously been noted on the ground, namely the existence of other and fainter ramparts within the area of the camp, evidently representing an older fortification. Mr. O. G. S. Crawford at once suspected that this might be an example of a rare type of neolithic work such as has recently been excavated by Mr. Alexander Keiller at Windmill Hill, Avebury, Wiltshire, another example of which has since been identified in Whitehawk Camp, Brighton (see pp. 67-8 and Plate XIX). These expectations have proved to be correct, for the writer has had the privilege of carrying out excavations there in 1928, which, though limited in extent, have shown that St. Roche's Hill was occupied at two periods, namely, in the neolithic period and in the Early Iron Age.

In the neolithic period, contemporaneously with the working of the flint-mines (2000 B.C.), concentric ramparts were thrown round the summit of the hill, the innermost enclosing an area of about two and a half acres. The most characteristic feature of the work of this period is the fact that the ditches, from which the soil was taken to form the ramparts, are interrupted at short intervals by numerous causeways, so that it is difficult to see how they can have afforded efficient protection against an enemy (Plate XVI). Evidence, however, comes from Germany that these gaps formed part of a very complicated scheme of defence, largely consisting of wooden towers and other constructions which have since perished.

Into the ditches the people were in the habit of throwing their refuse—beef-bones, broken pottery, ashes, flint saws, and broken querns for the most part. The examination of this material shows that the people of this period domesticated the long-horned ox, horned sheep, pig, and dog, while the charcoal of their ashes revealed that at least eight kinds of trees grew in the neighbourhood, including the poplar, willow, hazel, ash, and apple. The snail-shells, too, were of such a kind as to indicate a damp woodland climate, much wetter than that of the present day. The pottery is of a type that has hitherto been quite rare in England; its principal characteristics are round bottoms and horizontal lugs or ledges for handles (Plate XVII).

It was the last people to occupy the hill—the people of the Early Iron Age—who, a century or two before Christ, reared the great and massive ramparts that are such a conspicuous feature of the site. It is probable that in doing so they followed the line of the outermost neolithic defence, except on the north side of the hill, where the latter can be distinguished outside the Celtic rampart. At the point where the later vallum crosses over the earlier ditch the skeleton of a young woman was discovered lying in the crouching position characteristic of interments made at the end of the neolithic period, say, 2000–1800 B.C. (Plate XVIII). She was between twenty-five and thirty years old, stood 4ft. 11in. in height, and her bones show that she was of that Iberian race to which the people of the neolithic period belonged.

As at the Caburn, so here also the Celtic inhabitants dug numerous pits all over the interior of the camp, some of them encroaching on the old neolithic ditches. These pits yield the same kind of refuse and served the same purposes as the similar pits in the Caburn, and the material strongly suggests that

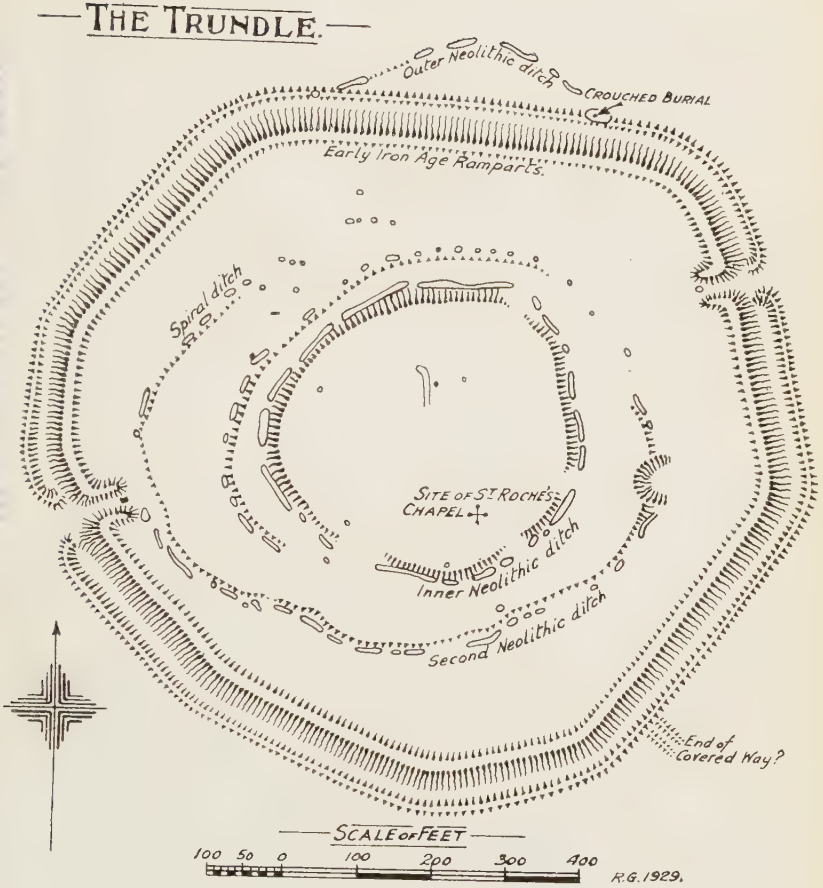


PLATE XVI

PLAN OF THE TRUNDLE.

The neolithic ditches (2,000 B.C.) are interrupted by numerous causeways, and contrast with the great outer rampart and ditch which was thrown up in the Early Iron Age (400-100 B.C.).

From a survey by the author.

this hill-city was abandoned during the first century before Christ.

Now it so happens that it was at just about that time that the city of Chichester, called Regnum by the Romans, must have come into existence. The second century geographer Ptolemy calls it Noiomagus, and quotes an earlier geographer, Marinus Tyrius, to the effect that Noiomagus was fifty-nine miles south of London—a reasonably accurate statement. The name Noiomagus is Celtic, and according to Prof. Ekwall signifies ' new plain '—a term which can only mean ' new city on the plain.' These facts leave very little room for doubt that the Trundle was the capital city of the tribe of the Regni, and was Old Chichester, if one may so term it, and that in about the first century before Christ the city migrated from the hills to its present situation on the plain, where it had the advantage of a good harbour. If this was so, it was not an isolated instance of city migration. Deserted earthen hill-cities may be seen in the neighbourhood of some Romano-British towns, as Dorchester and Bath, while in the case of Salisbury the migration was actually deferred till the middle ages, when Old Sarum was deserted in favour of the present site.

Water-supply

Where did the inhabitants of all these fortresses get their water-supply? This question is constantly being asked, but cannot, unfortunately, be fully and satisfactorily answered. At the present day wells on the Downland area—at any rate on the hills—must be sunk something like 300 feet to reach water. A well is a thing that would easily be filled up and lost sight of, but it is extremely improbable that pre-Roman peoples would dig so deep for water. Much more likely is it that the inhabitants depended on surface collection in some form, whether within

the ramparts, as at the Caburn, or in the trodden and puddled bottoms of the outer ditches. Recent investigation has shown that the Early Iron and Roman periods fall within the sub-Atlantic climatic epoch, when the rainfall was heavy, the temperature cool, and evaporation low.* We have also evidence that the water level in the chalk stood a good deal higher than it does to-day, so that not only was there more chance of catching and preserving the surface rain, but in all probability springs welled up in valleys which now are dry.

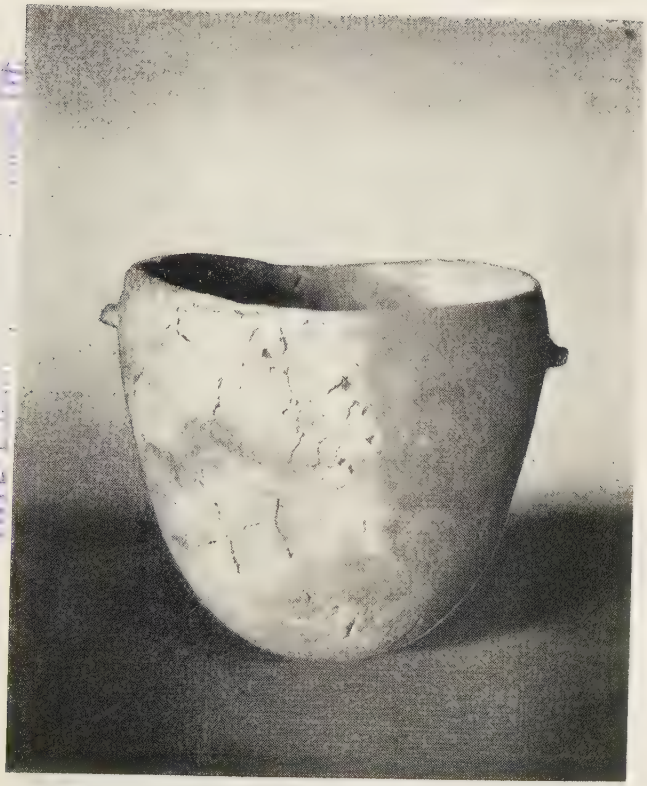
In New Zealand are to be seen many analogous hill-forts which were inhabited by Maori until quite recent times, and much information still exists regarding the sieges they underwent, and the customs of the inhabitants. Mr. Raymond Firth, in describing these, says : " The weak point was usually lack of water. As a rule, the hill-fort had no spring within it, and anyone venturing out to get water was cut off by the besiegers. In some forts attempts seem to have been made to keep an artificial supply. . . . But as a rule water storage was of a very elementary kind, and time and again a beleaguered fortress was taken or surrendered through lack of water."† If one may judge from analogies in recent times, especially in such countries as Algeria, where hill-top cities are still inhabited,‡ inter-tribal warfare would take the form of raids by small parties rather than of sustained attack by many acting in concert, and sieges or blockades would be practically unknown.

Nowadays water is obtained for the Downland sheep by constructing ' dew-ponds.' These are specially designed to collect and store water from the atmosphere, for which purpose they are made

* *Antiquity*, I, p. 412.

† Raymond Firth, " Maori Hill-Forts," *Antiquity*, I, p. 77.

‡ M. W. Hilton-Simpson, "Algerian Hill-Forts of To-day," *Antiquity*, I) pp. 397, 401.



Photograph] [*E. C. C.*

PLATE XVII

NEOLITHIC BOWL FROM THE TRUNDLE.

Note the round bottom, plain rim and ledge handles.

shallow and are lined with an impervious material such as puddled clay or chalk or even cement. Such ponds function best on the high exposed hills, especially at the heads of long valleys,* but all the existing specimens are quite modern, and the author knows of no evidence that their principles were understood in prehistoric times, though a theory to this effect was brought forward some years ago.

These sketches of Cissbury, the Caburn, and the Trundle will serve to give some idea of the fortified strongholds of prehistoric Sussex, but it must be remembered that each Camp must be judged on its own merits, and these can only be ascertained by excavation. As this has for the most part not yet been done, we must be content to realise that we know very little of the remaining Camps of the county, nor must we suppose that they were all necessarily occupied at the same time. Until such knowledge is gained it is useless to formulate theories designed to account for the topographical distribution of these earthworks.

In the appended list is embodied such information as is available, and only such details as will help the student to make independent inquiries for himself.

Eastbourne District :

1. Beltout : 6 in. O.S., 82, N.E. A portion only of the *enceinte* of what must have been a large Camp remains, the rest having been destroyed by coast erosion. The old Beachy Head lighthouse stands within the area of the Camp, also two intersecting valley entrenchments (partially destroyed), excavated some years ago by Mr. H. S. Toms and others, and referred to the Bronze Age. The date of the surrounding Camp itself is unknown.
2. Babylon Down : 6 in. O.S., 79, N.E. A poorly marked circular enclosure, some 400 ft. in diameter, and ¼ mile south of the barrow called ' Cold Crouch.' Not marked on O.S.

* The question of dew-ponds is ably discussed by Dr. E. A. Martin in *Dewponds : History, Observation and Experiment* (T. Werner Laurie, Ltd.)

3. Combe Hill : 6 in. O.S., 79, N.E. An incomplete circular enclosure, with a secondary outer defence on the west side. The main ditch is interrupted by seventeen causeways—a feature which is characteristic of neolithic work. Compare Whitehawk (No. 10) and the Trundle (No. 20). See plan, p. 168, at end.

Seaford District :

4. Seaford Head : 6 in. O.S., 79, S.W. An angular fragment only of what was once a formidable Camp remains, the rest having been destroyed by coast erosion. Examined by Pitt Rivers in 1876 with inconclusive results, except that the ramparts date from before the second century A.D. See *Journ. Anthrop. Inst.*, VI, pp. 287-299. There was a second cent. Romano-British cemetery in the valley, one-third of a mile to the north.
5. Newhaven Head : 6 in. O.S., 78, N.E. Some kind of Camp is reported to have existed on this hill, but what was spared by coast erosion has been largely destroyed by the construction of the modern fort in 1865, when a large refuse-heap was discovered and ascribed to the Roman period. This midden was described as being 100 yards long, and consisting of the following layers, from above downwards : (1) mould ; (2) mussels, limpets and a few oysters ; (3) disintegrated soil containing bands of carbonised matter, burnt flints, burnt clay, pottery and a few shells ; (4) pebbles and flints ; (5) the undisturbed clay which overlies the chalk at this point. The animal remains included pig, ox, goat, sheep and dog. Two pieces of bronze, one of iron, and one of lead were found. See *Journ. Anthrop. Society*, IV (1866), pp. clxxxvii *et seq.* A number of bronze implements, attributed to *c.* 900 B.C., were found here in 1917, including the blade of a short sword, a knife, a spear-head, two gouges, one chisel, a bradawl, and a pommel. A horde of Roman bronze coins were discovered in a pot when digging near the modern fort in 1920. They had been buried about A.D. 285 (*S.A.C.*, LXII, p. 201).

Lewes District :

6. Mount Caburn : 6 in. O.S., 67, N.E. For description see above (pp. 45-53). Excavations by Lt.-Gen. Pitt

Rivers (Colonel Lane Fox), *Arch.*, XLVI, pp. 423-495. Excavations by E. and E. C. Curwen, *S.A.C.*, LXVIII, pp. 1-56.

7. Ranscombe : 6 in. O.S., 67, N.E., and 54, S.E. It is not quite certain whether this was a Camp at all ; the only remains are a rampart (with ditch on east side) thrown across the neck of the hill some 500 yards west of the Caburn Camp (see No. 6, above). Most of the rest of the hill west of this rampart is bounded by cultivation scarps, but there are no traces of ramparts. Pitt Rivers examined the existing rampart, and proved it to be definitely pre-Roman, but his data do not admit of a more precise verdict. See *Arch.*, XLVI, pp. 471-6.

Brighton District :

8. Ditchling Beacon : 6 in. O.S., 53, N.W. The shape of this Camp is between a square and a circle ; the rampart is at present slight, and is lacking on the steepest side. The ponds at the N.W. corner are later than the rampart and have been made at its expense. Excavations by the Brighton and Hove Archæological Club in December, 1929, threw no definite light on the date (*S.A.C.*, LXXI).

9. Hollingbury : 6 in. O.S., 66, N.W. The shape is between a square and a circle, and the area about 6 acres. Of the apparent entrances those to the E. and S.W. are the only original ones. Near the centre are the remains of pits, and three barrows. Many years ago a hoard of bronze implements was found somewhere on this hill, but their connection with the Camp is doubtful. They include 4 loops of bronze of a kind peculiar to Sussex (See *S.A.C.*, LXI, pp. 73-5). In 1908 a rare type of pottery was found at the bottom of a pit 4 ft. deep near the S.W. angle of the Camp. Its nearest parallel is Hallstatt ware of about the sixth century B.C. For description of camp see *Brighton and Hove Archæologist*, I, pp. 12-21.

10. Whitehawk : 6 in. O.S., 66, S.W. This camp has a characteristically neolithic plan consisting of 4 concentric rings of ditches interrupted by numerous causeways, with spaces of level ground between each ditch (Plate XIX). The plan is oval, the area enclosed by the outermost ditch being some 10 acres, and that by the

innermost 1½ acres. The outer ditch is incomplete on the E. where the ground falls steeply, but on the N.E. and S.W. it has radial or tangential ditches cutting off dead ground between the ramparts and the brow of the hill (see plan, Plate XIX). The two outer ditches have remains of considerable ramparts, but the two inner ditches are very largely obliterated, and their course has been determined by percussion of the ground. The camp has been much damaged by the formation of the Brighton Race Course and by allotment gardens. Excavations carried out in the N.E. quadrant of the camp by Mr. Reginald Williamson and Dr. D. A. Crow for the Brighton and Hove Archæological Club in January, 1929, proved that the camp was neolithic and had not been occupied subsequently. Much neolithic pottery was found, with animal bones, hammer-stones, grain-rubbers, pointed bone tools, flint saws, two leaf-shaped flint arrowheads, a *petit tranchet* arrowhead, and two re-chipped polished flint axes. The period thus corresponds with that of the earlier camp at the Trundle (No. 20, below). Report not yet published.

11. Castle Hill: 6 in. O.S., 66, N.E. At the junction of the parishes of Rottingdean, Iford and Kingston. A quadrilateral enclosure, some 250 by 150 ft., bounded by rampart and ditch. Abutting on the N. side is an old ditch, perhaps a boundary, or else an earthwork of 'covered way' type.

12. Wolstonbury: 6 in. O.S., 52, N.E. A ring-work with the unusual feature of the ditch on the *inner* side of the rampart. The surface of the hill has been much worked for gravel in recent times, and to this the numerous pits are to be attributed. There are remains of an oval inner ring, both rings being not later than fourth century B.C. (see *S.A.C.*, LXXI).

13. The Dyke (Devil's Dyke): 6 in. O.S., 52, S.E. The Camp has an irregular elongated shape ½ mile in length, and follows the contour of the promontory on which it stands. The modern road to the Dyke Park Hotel enters the Camp through its one original entrance. The only easy approach is along the ridge from the S.W., consequently the rampart on this side is massive and

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Photograph] [*I. C. C.*

PLATE XVIII

THE TRUNDLE, GOODWOOD.

The Skeleton of a Young Woman, dating from about 1800 B.C.

strong, and to it properly belongs the name 'Devil's Dyke,' rather than to the valley below as commonly supposed. This great earthwork is also known as the 'Poor Man's Wall,' 'Poor Man' being a euphemism for the Devil. The rest of the *enceinte* of the Camp consists of a feeble double rampart on the N.W. and S.E. sides, and a single rampart and ditch at the N.E. end. Nothing is known of the date of the Camp. The interior has been much disturbed by modern buildings and cultivation, but no finds have been reported.

14. THUNDERSBARROW HILL : 6 in. O.S., 65, N.W. A small circular Camp with much reduced ramparts and obliterated ditches. The remains of a smaller quadrilateral enclosure can just be traced in the interior, and has been proved to date from the fifth century B.C. (*S.A.C.*, LXXI). It has an entrance on the W., while those of the Camp were probably to N. and S. The hillsides to W. and S. are covered with cultivation terraces of type referable to the Early Iron Age or Roman period (see next chapter), much mutilated by military trenches dug about 1915, a remarkably fine series of terraces on the south side being known as 'Thunder's Steps.' These cultivations seem to have been accompanied by a contemporary road. See surveys and notes by Messrs. R. Gurd, W. J. Jacobs and H. S. Toms in *Brighton and Hove Archæologist*, II (1924), pp. 81-6.

Worthing District :

15. CHANCTONBURY RING : 6 in. O.S., 51, N.W. A small oval Camp planted with trees at the end of the eighteenth century, and forming a well-known landmark for miles around. The only entrance is to the S.W. In 1909 the flint foundations of Roman buildings were discovered within the Camp and partially explored ; with them were tesserae (i.e. squares from mosaic pavements), characteristic heavy roofing tiles and pieces of clay drain-pipes. The pottery belonged to the first and second centuries A.D., and the 13 coins ranged from the middle of the first to the end of the fourth century, two belonging to the first century, three to the third, and eight to the fourth. These buildings constituted a

Romano-British temple of a well-known type (see *Antiq. Journ.*, VIII, pp. 300-326), and they are certainly later than the rampart of the Camp (G. S. Mitchell, *S.A.C.*, LIII, pp. 131-7). A late second century bronze fibula (brooch) was also found at the same time (*S.A.C.*, LXIII, p. 220). Two terrace-ways, characteristic of Roman work (see chap. VI) descend from the Camp to the Weald below. A well is said to have existed in the valley to the S., and was attributed to the Romans. Earthworks span the ridges at a distance of some 400 yards from the Camp, both on the W. and S.E. sides. Whether that on the west was designed to defend the approach would be difficult to determine. That to the S.E., which is sickle-shaped in plan, and has a ditch between two banks, was originally designed as a *road* (see chap. VI) leading across the hill from valley to valley, but may have been later utilised as a defence for the Camp. A large modern dew-pond occupies the concavity of the curve, but the existence of this curve suggests that the pond occupies the site of some structure such as a barrow which the earthwork desired to avoid (*S.A.C.*, LIX, pp. 53-5). Three low mounds outside the gate of the Camp were opened by Pitt Rivers, but yielded nothing, and were therefore considered by him to have formed part of the system of defence (*Arch.*, XLII, pp. 42-4). See also Plate XXV.

16. Cissbury: 6 in. O.S., 64, N.W. For description see above (pp. 53-60). Excavations by Lt.-Gen. Pitt Rivers (Colonel Lane Fox), *Arch.*, XLII, pp. 53-74; *Journ. Anthrop. Inst.*, V, pp. 357-390; H. S. Toms, *S.A.C.*, LXVII, pp. 55-83. See also bibliography at end of chap. II.

17. Highdown: 6 in. O.S., 63, S.E. A small rectangular Camp of unknown date. Rampart and ditch are replaced by a simple scarp on the N. and part of the W. sides. Entrances are to S. and E. A circular platform on the S.W. corner marks the site of a windmill. Some hollows in the neighbourhood of this were found by Mr. G. V. Irving in 1857 to have been connected with this mill. Pitt Rivers discovered a curious pit with stepped sides just inside the S. rampart, containing an

urn and a bronze dagger, probably a late Bronze Age interment. A skeleton, presumably a later burial, was found above this. In 1892 a Saxon cemetery was discovered within the Camp by Mr. Edwin Henty when planting the clump of trees that now stands there. The interments were all made E. and W., with head to west, at a depth of 2½ to 5 feet, and were mostly accompanied by weapons, ornaments, etc. Eighty-six graves were opened, and were assigned to the sixth century A.D. The principal relics of interest were (1) a Frankish *angon*, or iron spearhead, rare in England; and (2) a glass vessel of unusual form, bearing a representation of hounds chasing a hare, and a Greek inscription meaning 'Use (me) in health.' The exiguous contents were analysed and proved to be the remains of a scented cosmetic. It is now in the Worthing Museum. For accounts of excavations see: G. V. Irving, *Journ. Archæol. Assoc.*, XIII (1857), pp. 289-294; Colonel Lane Fox, *Arch.*, XLII, pp. 74-6; Sir C. H. Read, *Arch.*, LIV, pp. 369-382; LV, pp. 202-214.

18. Harrow Hill: 6 in. O.S., 50, S.E. A small Camp, in shape a rectangle with rounded corners and bulging sides. Entrances are to W. and N.E. The Camp is later than the flint-mines, most of which are outside its limits, but some have been levelled within its area. Mr. H. C. Collyer dug trial trenches some years ago, with inconclusive result. The name 'Harrow' is derived from an Anglo-Saxon word signifying a heathen temple. See *S.A.C.*, LXIII, pp. 27 ff., also references at the end of Chapter II.

Chichester District:

19. Halnaker Hill: 6 in. O.S., 49, S.W. A very ill-defined ring-work, in the centre of which stands a ruined windmill.

20. The Trundle (St. Roche's Hill, Goodwood): 6 in. O.S., 48, N.E. Neolithic and Early Iron Age; for description of excavations see above (pp. 61-3 and Plates XV and XVI). On the highest part of the hill is the site of St. Roche's Chapel, which flourished in the fifteenth century. The termination of what seems to have been a

' covered-way ' (see Chap. VI) appears just outside the main rampart on the east side, suggesting that the ' covered-way ' was destroyed by the construction of the Camp. To the N. of the Camp are outworks with the ditch on the *upper* side of the bank—an unusual feature. Described in *S.A.C.*, LVIII, pp. 74-80. For excavations see *S.A.C.*, LXX (1929).

21. Bow Hill : 6 in. O.S., 48, N.W. A small rectangular Camp with entrance to E., opening on to an ancient road, and intimately associated with other earthworks which will be described later (see Chap. VII). Area, about 1 acre. Described in *S.A.C.*, LVIII, pp. 85-7.

22. Goose Hill : 6 in. O.S., 48, N.W. This Camp, ¾ mile north of the last-named (No. 20), is very strangely situated on a rather steep hillside. It consists of two concentric circular ramparts, the outer being imperfect on the lower (E.) side. The bank which runs across the centre from N. to S. is a modern boundary. Mr. Hadrian Allcroft's recent suggestion that this work may be of medieval origin, and connected with the family of Goushill, deserves consideration. Described in *S.A.C.*, LVIII, pp. 80-85.

23. Beacon Hill : 6 in. O.S., 34, N.W. A large rectangular Camp. The mole-casts in the interior yield fragments of coarse, gritty pottery, and a hoard of bronze axes was found there some years ago. The gate on the west side is approached by a fine oblique road which appears to be contemporary. Further to the west, on the slope of Harting Down, the continuation of this track can be picked up as a cambered road between ditches—a Roman feature—and at the foot of the slope of Harting Down Rom. Brit. pottery and coins of Gordian and Gratian have been found just north of the track. The further continuation westwards descended to the Weald by a fine grassy terrace-way, called the Miller's Walk, also characteristic Roman work.

Tunbridge Wells District :

24. Saxonbury : 6 in. O.S., 18, N.W. (mid-way between Frant and Mark Cross). A ring-work—the only example of its kind yet discovered in the Weald.

Excavations by Mr. Winbolt in the Spring of 1929 revealed an inner elliptical area bounded by the remains of a dry stone wall, 17ft. thick, belonging to the century immediately preceding the Roman period. La Tène III pottery and much iron slag was found, so that the camp seems to have been a kind of fortified mining station in connection with the iron mines of the Ashdown Forest. The date of the outer rampart is not settled.

Besides the foregoing, the following fortified positions, though of a totally different character, deserve mention for the sake of completeness :

25. PHILPOTS (W. Hoathly) : 6 in. O.S., 15, N.E. A triangular promontory fortress bounded on two sides by cliffs, and on the third by a rampart and exterior ditch. There is no history, nor evidence as to date or period. See *S.A.C.*, LXVI, pp. 176-179.
26. HENFIELD COMMON : 6 in. O.S., 38, S.W. The remains of what appears to have been a promontory fort on the tongue of land immediately N. of the Common. The slender remains of the rampart are to be seen in the garden of one of the houses and immediately to the N. of it, but it has been almost destroyed by the neighbouring sand-pit workings. See *S.A.C.*, LXVI, pp. 179-180.
27. BURPHAM : 6 in. O.S., 50, S.W. A fine promontory fort, bounded on the north by a high rampart and ditch, with one gate, and on the remaining sides by cliffs. This was built by the Saxons as a fortress to guard the valley of the Arun (formerly called the Tarrant), and so was in a sense the precursor of Arundel Castle. Burpham is referred to in the Burghal Hidage as a fortress in the tenth century for protection against the Danes (cf. No. 28 below). See *S.A.C.*, LXIII, pp. 2, 3.
28. CHURCHYARD OF ST. JOHN-SUB-CASTRO, LEWES : 6 in. O.S., 54, S.W. This was a rectangular promontory fort, and is believed to have been the Saxon fortress built to guard the valley of the Ouse (formerly called the Medewynd), and thus the precursor of Lewes Castle (cf. Burpham, No. 27). It is probably the work of

King Athelstan (895-940), who ordered Lewes to be fortified as a *burh*. See *Arch. Journ.*, LXXIV, pp. 41-7.

29. East Hill, Hastings : 6 in. O.S., 71, N.E. A promontory fortress defended on the E. by ramparts and elsewhere by steep scarps or cliffs. As Hastings together with Burpham and Lewes are mentioned in the Burghal Hidage as *burhs* fortified against the Danes, it is probable that this Camp was the Saxon *burh*.

30. Edburton Hill : 6 in. O.S., 52, S.W. A small Norman earth-castle of motte-and-bailey type. The situation is unusual, but the type is definite, belonging to the period between the Norman Conquest (1066), and the beginning of the building of stone castles.

ADDENDUM

31. Barkhale Down, near Bignor Hill : 6 in. O.S., 49, N.E. A small oval Camp has been discovered here in 1929 by Dr. J. A. Ryle. It has a single line of rampart, not strong, and with what looks like interruptions in the ditch, suggestive of neolithic work. There is a short parallel outlier on the S.E.

The hill-forts of Sussex are also described in the following :

1. A. Hadrian Allcroft, *Earthwork of England* (1908), chaps. xviii and xix.
2. Col. A. Lane Fox (Lt.-Gen. Pitt Rivers), ' The Hill Forts of Sussex,' *Arch.*, XLII, pp. 27-52.
3. *Victoria County History of Sussex*, I, pp. 455 ff.
4. For a general description of neolithic Camps (including Sussex examples) see *Antiquity*, IV, No. 1 (March, 1930).

Chapter V

VILLAGES AND CULTIVATIONS

> Elldud . . . improved the mode of ploughing land and taught the Kymry better than was known before, and he gave them the system and art of cultivating lands as is used at present, for before that time land was cultivated only with the mattock and overtread plough, after the manner of the Irish.
>
> —Triads of the Isle of Britain.

If there were fenced cities on the Sussex hill-tops in the days before history began, there were also many unwalled villages and hamlets lying amid sunny corn-fields. For at least a thousand years before the coming of the English the Celtic peoples of the south-east of Britain grew corn in considerable quantities, and the people of the Sussex Downs were no exception. To this we have the testimony of classical writers as early as the fourth century before Christ. Strabo tells us that the Massilian explorer Pytheas, who visited Britain in 325 B.C., observed an abundance of wheat in the fields, and remarked the necessity of threshing it in barns owing to the wet climate.* About the same time Hecataeus of Abdera bears a similar testimony, but differs in his estimate of the climate.† In Cæsar's time (55 B.C.) we learn that agriculture was practised in the south, and that the population was large and the settlements crowded. He himself was able to keep his

* Strabo, IV, v. 5 ; *see* Elton, *Origins of English History*, p. 30.
† Diodorus Siculus, II, 47.

army of 12,000 men for a fortnight on wheat reaped in the neighbourhood of Walmer in Kent, and in the following year he obtained enough in Essex to maintain four legions and their auxiliaries and 1,700 cavalry.* Other writers add further details—how, for instance, the land was marled with chalk,† how the harvests were late owing to the wet climate,‡ and how the Britons reaped their corn by cutting off the ears and storing them underground.¶

When, however, we come to the middle of the fourth century A.D.—towards the end of the Roman occupation—we find that Britain was actually able to export large quantities of corn to the devastated Rhine provinces, for which purpose some 600 or 800 ships were employed by the Emperor Julian.‖

The picture we receive from these writers is one of an agricultural people striving against an over-wet climate, taking trouble, and getting good results. Where was all this corn grown? The answer is to be found in the numerous traces of ancient cultivation that may be seen all over the chalk hills of the south-east of England, traces in which the Sussex Downs are particularly rich.

The rambler on the Downs can scarcely fail to have noticed certain grassy ridges or banks, varying in height from a few inches to several feet, running across the gentle southern slopes of the hills. They are generally found to lie roughly parallel to one another, and to enclose more or less rectangular pieces of ground of very varying dimensions. These banks, which are called *lynchets*, are always the result of cultivation, and in some cases give the hillside quite a terraced appearance.

* Cæsar, *B.G.*, IV, 31, 32; V. 20. See Rice Holmes, *Ancient Britain*, p 253
† Pliny, *N.H.*, XVII, 4.
‡ Tacitus, *Agricola*, XII.
¶ Diodorus Siculus, V, 21.
‖ Zosimus, III, 5. See Gibbon, *Decline and Fall of the Roman Empire*, Chap. XIX.

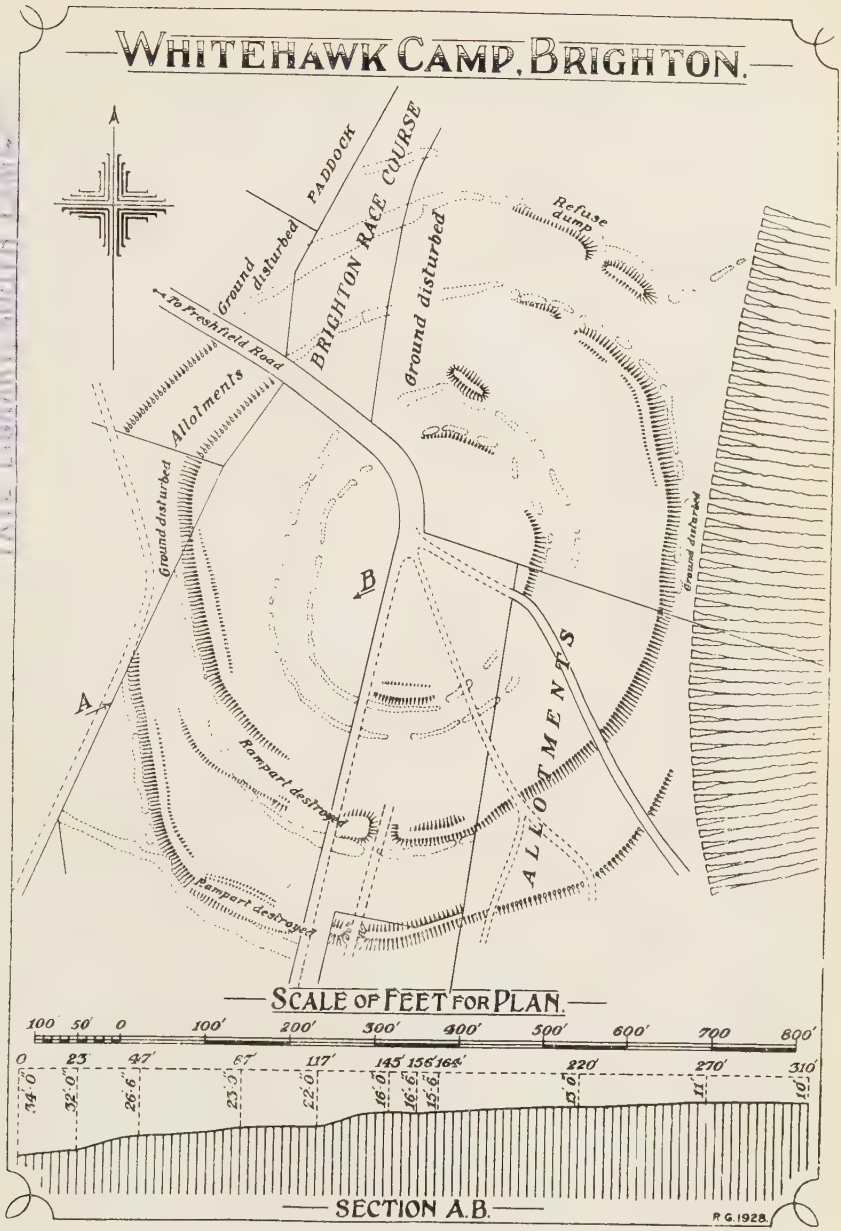
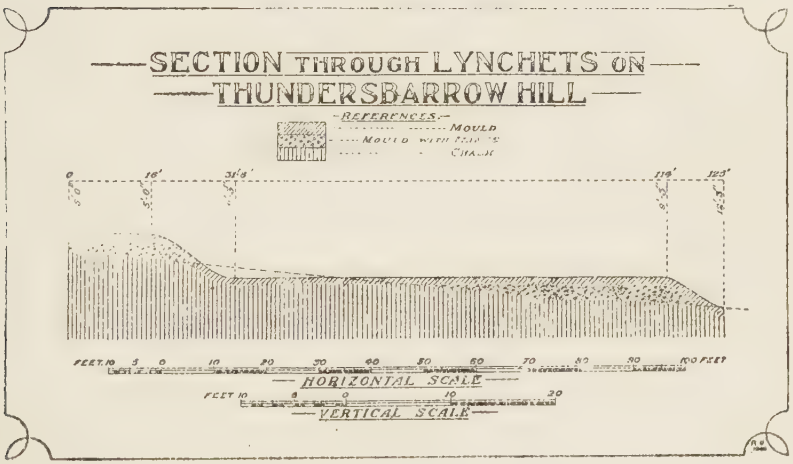


PLATE XIX

Note the four concentric rings of interrupted ditches, characteristic of neolithic camps.

From a survey by the author.

When the turf is removed from a piece of ground on a hillside, and the soil disturbed by ploughing, there is a tendency for the latter to travel downhill under the influence of rain and gravitation, and to form an accumulation along the lower edge of the plot at the expense of that at the upper edge. It is surprising what a large bank, or lynchet, can result from the long continuance of this process (see fig.).



Reproduced from Sussex Arch. Coll. LXIV.]

It is in this way that the outlines of ancient fields have been preserved for us. How, then, are we to find out when they were cultivated?

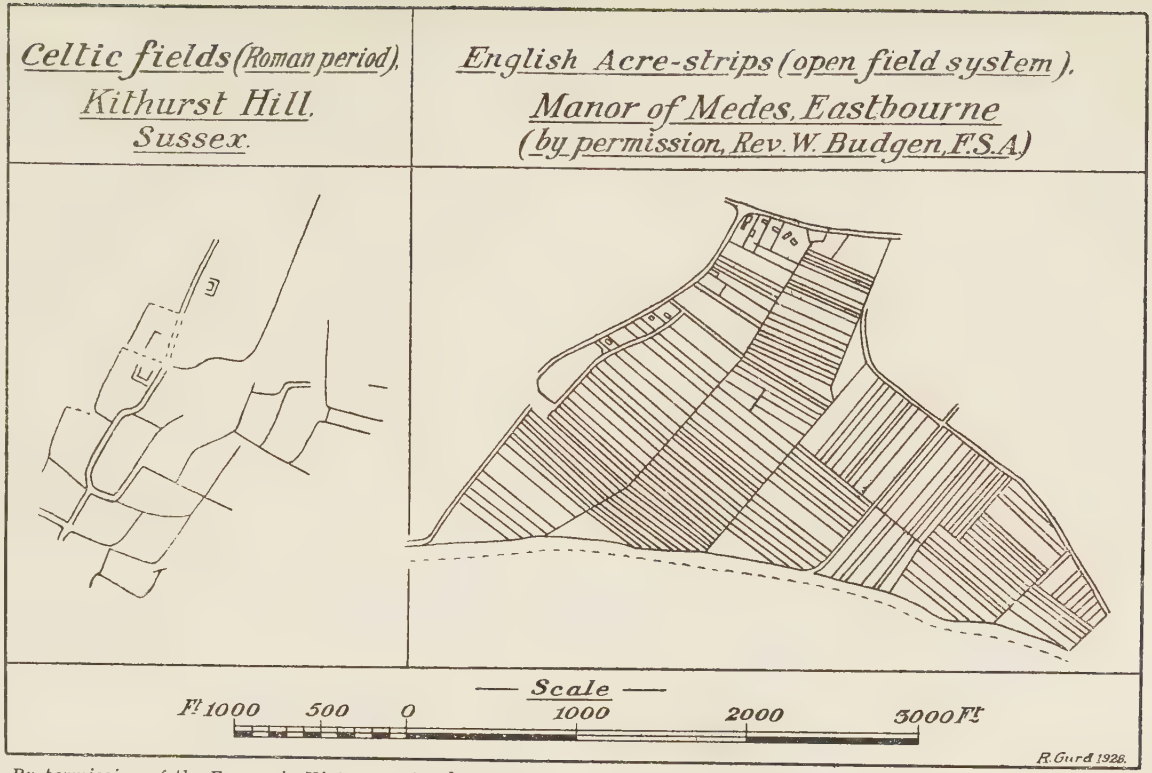
If we study a large number of these old cultivated areas we shall at once notice that the fields tend to be rectangular, their length rarely more than 400 feet, and their breadth generally over 100 feet. They are frequently arranged in long rows, either along a hillside, or placed one above another. In the former case the divisions between adjacent fields are not always visible, and this may give rise to the appearance of a long, narrow strip of ground of fairly large dimensions.

Now we know that in medieval times the fields consisted of strips of one acre or less, all of a nominally constant length of one furlong (i.e. furrow-long), or 660 feet, and a breadth of just one-tenth of the length, viz., 66 feet. These fields are called for convenience '1 × 10 acres,' because the length was always ten times the breadth. The strips were arranged in groups side by side, with their ends all in a line, and forming a more or less rectangular piece of ground called a furlong or shot, and the different acres were ploughed by different tenants in accordance with the custom of the English open-field system. When, rather more than a century ago, the various Enclosure Acts were passed, these furlongs were enclosed with hedges, and the acre-strips, passing into one man's ownership, lost their individuality. Where our modern fields, especially in the Weald, represent the furlongs or shots of a past generation, one dimension will be found to be about a furlong, and the field is often still called the 'Ten-acre' or 'Seven-acre,' or the like.

This system, which can be traced back to the time of the Saxons, clearly bears no sort of resemblance to that of the Downland lynchets. The long, narrow strips of the one afford a sharp contrast with the shorter and broader fields of the other, and the arrangement of the two types is quite different (see fig., p. 79).

Now if the English type has continued in use since the time of the Saxons, one would infer that the Downland type belonged to an earlier era, and this is actually proved to be the case by such direct evidence as is available.

Thus, in Arundel Park, and also on the Brighton and Hove Golf Links, a barrow has been constructed right on top of a lynchet, showing that in each case the field must have already gone out of cultivation before the barrow was made.



By permission of the Economic History Society.]

PREHISTORIC CELTIC AND MEDIEVAL ENGLISH FIELDS CONTRASTED

In parts of Sussex, and also in Wessex, fields of this type are found clustering round the sites of Romano-British and Early Iron Age villages. In fact, wherever these lynchets come into contact with ancient remains, they are always found to be contemporary with those of the Celtic period, that is, broadly speaking, the great corn-growing period that existed for a thousand years before the coming of the Saxons (say, 500 B.C. to A.D. 500). This, therefore, is known as the Celtic field-system, and its fields belong to what is called the Celtic type (Plate XXIII).

The distinction between the Celtic and English types of field-systems is as important archæologically as it is sharply marked. Being so widely distributed, lynchets are sometimes found to come into definite relationship with earthworks, as we have seen at Cissbury, and with roads, as we shall see in the next chapter. In each case they should give us valuable information with regard to the date of the earthwork or road in relation to the Celtic period.

Before going on to examine the settlements in which these agricultural people lived, it will be instructive and interesting to consider the fundamental reasons underlying the difference between the Celtic and English field-systems. In other words, why were the Celtic fields short and broad, and the English acres long and narrow?

The principal factor governing the shape of a field is the nature of the implement used for breaking up the ground. It was a deeply rooted habit among most ancient peoples that the size of a plot should represent the amount of ground which could be broken up in a day by one man. It will be obvious, then, that the more efficient the type of plough in general use, the larger the field will be. The study of the development of the corn-field depends, therefore, upon that of the evolution of the plough. This is the first main principle.

Photo, H. B. Curwen, 1920] *[From Sussex Arch. Coll. LXIV*

PLATE XX

SKYE CROFTER USING THE CASCHROM.

The most primitive implements used by modern savages for breaking up the ground are various forms of digging-sticks and hoes, and there is no reason to doubt that some tool of this sort was used by the neolithic people of this country. The hoe in its simplest form consists of a forked branch, of which the stem is cut away, the longer limb forms the handle, and the shorter limb the 'business end.' The important point about such a tool is that in its use it forms no furrow but breaks up the ground irregularly.

If a hoe is dragged continuously through the soil, we have the germ of the idea of the plough. If its size is increased, with the addition of a handle, or stilt, to steady it at the rear, and the substitution of animal for human labour, we have all the essential features of a plough.

The second main principle, then, is the distinction between those implements which make a furrow and those which break up the ground irregularly. In the latter case the corn-plot will be small and irregular in plan ; in the former it will be rectangular and rather larger, because more work will be accomplished in the day. Examples of the small, irregular type of plot may be seen on Dartmoor and Bodmin Moor, attached to hut-circles of the Early Bronze Age or even, perhaps, the neolithic period, but they are not known in Sussex. Their agricultural origin is proved by the lynchets which are found with them.

The length of a furrow in a field is governed by two considerations : it must not be so long that the oxen get tired before they come to the end of it, nor must it be so short that time is wasted in unnecessarily frequent turnings of the plough. The Roman agricultural writer, Columella, tells us that for a team of two oxen a furrow of 120 feet was long enough.* Remembering that the area of each field was traditionally fixed at the amount that could be

* Columella, II, ii, 27.

ploughed in one day, it follows that the shorter the furrows, the wider the field will be, and the more nearly approaching to a square ; conversely, the longer the furrows, the narrower and more strip-like will be the piece representing the day's work.

Now the kind of ploughshare employed by the Celtic peoples right down to the time of the Romans —and in some parts of Europe to the present day— was nothing more than an iron cap or *sock* which protected the point of the wooden plough from being worn away by the earth and stones through which it was dragged. Such a plough-point, unlike the later ' share,' will do nothing more than scratch a shallow groove in the soil—a most ineffective way of aerating it. In view of this Pliny and Virgil, the great Roman authorities on agriculture, recommend that every field should be ploughed in two directions, both longitudinally and transversely, the better to loosen and break up the soil. It is obvious that this will necessitate that the fields should be something approaching a square in shape. It is practically certain that in Britain during the Celtic period the plough-team was usually composed of two oxen, but whether they practised cross-ploughing we have no means of knowing. We do know, however, that their furrows were short, and their fields definitely ' squarish.'

Pliny further tells us that in eastern Switzerland there had been invented a heavier plough with wheels, and with a point, or *share*, possessing a broad blade which undercut the sods and turned them over as our modern ploughs do. The use of such a plough would involve two things : it would render cross-ploughing unnecessary owing to its power of completely aerating the soil, and it would necessitate a larger team of oxen to overcome the increased resistance afforded by the new ploughshare. The Teutonic peoples who used this instrument actually increased the plough-team to eight oxen, so that they were able to employ a

longer furrow without tiring the beasts. As we have seen, the longer furrow meant a narrower field, and so we have the 1 × 10 acre-strip with the furrow ten times as long as the width. The third main principle, then, is the distinction between the 'sock' worked by a small team and the 'share' worked by a large one.

The map of the distribution of these 1 × 10 acre strips in Europe makes it appear very probable that they originated in the neighbourhood of eastern Switzerland and the corn-growing regions of the valley of the Po, and that they spread north-westwards across Gaul and also into Germany, and so to Britain. Historically we know that they entered England with the Saxons, among whom they formed an integral part in the manorial system so characteristic of English local history. Emphasis has already been laid on the way in which the Celtic hill-settlements were destroyed by the Saxons, and on the fondness of the latter for the sheltered valleys and plains. This will explain why the lynchets of the Celtic agricultural system still survive in abundance on the Downs, and it also accounts for the scarcity of visible remains of Saxon or medieval English ploughing in the same area.

Of evidence of agriculture in Sussex before the Celtic period there are only the most meagre traces. We cannot prove that any of the existing lynchets date back to the late Bronze Age, though some of them may very possibly do so. The agriculture of the Celtic period was so intensive over the same area as that occupied by Bronze Age man, that any traces of earlier cultivation would be little likely to survive. There are, however, other evidences of agriculture besides lynchets, and these include the discovery of actual grain, of sickles, and of mill-stones for grinding corn. In Sussex, however, no grain or sickles have been found belonging to a period earlier than that of

the Early Iron Age,* so far as the writer is aware.

The kind of mill-stone in use from the neolithic period down to the coming of the Romans was the 'saddle-quern,'† which consisted of a large, irregular block of stone with a flattish or saddle-shaped top, on which another smaller block of stone was pushed backwards and forwards to grind the corn. These stones were only used for grinding cereals, so that the discovery of the whole or part of one constitutes evidence of agriculture. The top-stone of a saddle-quern was found deep down in the shaft of a neolithic flint-mine at Stoke Down near Chichester,‡ and several other specimens occurred in the neolithic ditches at the Trundle and Whitehawk Camp. These afford the earliest evidence of agriculture so far obtained in Sussex. Fragments of similar querns were also found in a late Bronze Age hut-site at Park Brow, Sompting, as will be described later. These glimpses, as it were, reveal that corn was grown on the Downs right back to about 2000 B.C., but to draw a more detailed picture of the process at that distant date it will be needful to make use of evidence obtained in other counties of England.

The cereals known at that time were wheat and perhaps also barley ; no oats earlier than about 250 B.C. have yet been found in Britain. They were grown in small, round, or irregular plots close to the huts. When the soil was exhausted, fresh ground was broken up with some sort of digging-stick or hoe. The corn was reaped by means of sharp flint flakes, probably set in a wooden frame, and having a serrated edge like a saw. Finally the grain was ground in saddle-querns, such as have been described above.

* For a discussion of the grain and sickles of the pre-Celtic period see *Antiquity*, I, pp. 261-6.

† The rotary quern, or revolving hand-mill, first appeared in Britain during the Early Iron Age, about 250 B.C., but its use did not become general until the Roman period.

‡ *Proc. Preh. Soc. E. Anglia*, IV, p. 86.

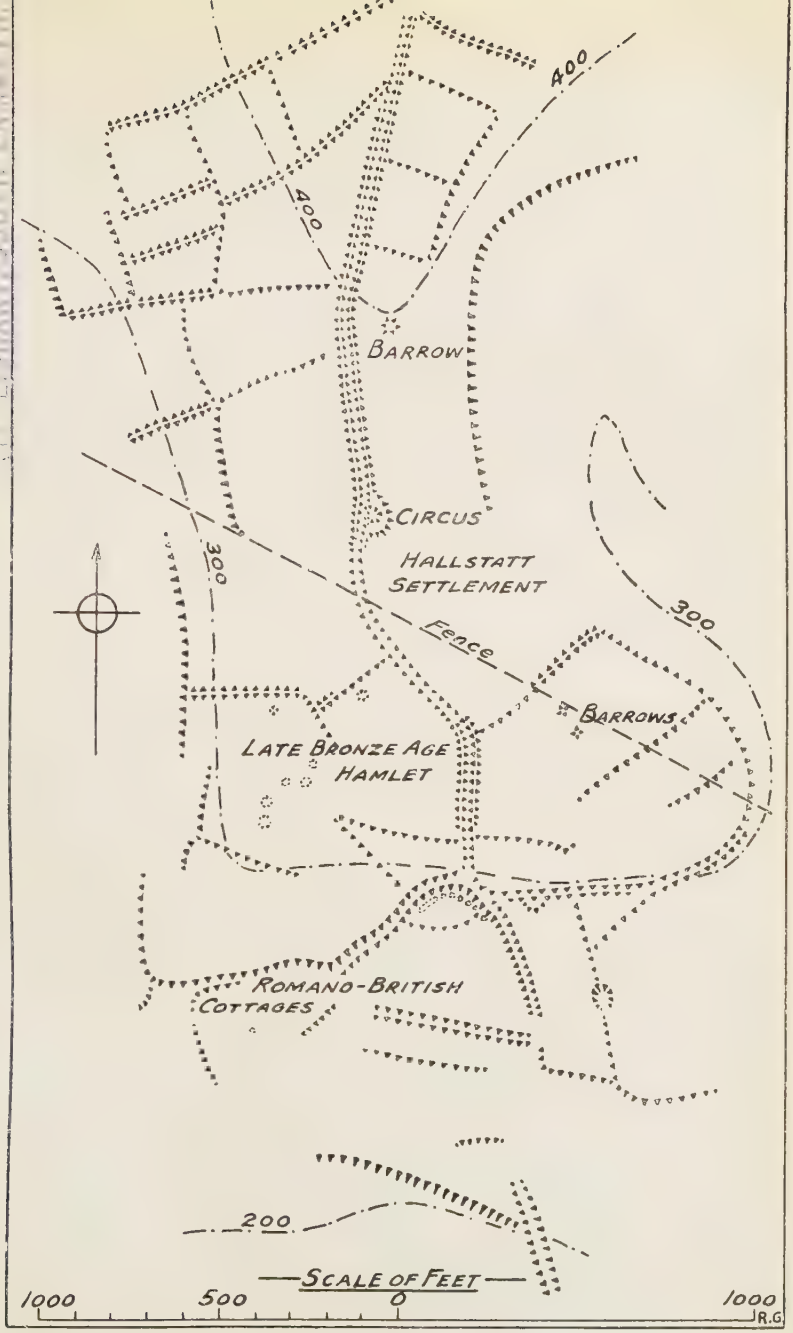


PLATE XXI

PLAN OF PARK BROW, SOMPTING.

Showing settlements, roads and cultivations dating from the sixth century B.C. to the fourth century A.D.

From a survey by the author.

During the Bronze Age improvement in agriculture was gradual, and kept pace with the introduction of improved appliances, the chief of which was the ox-drawn plough. This was probably not developed independently in Britain, but was introduced from abroad, and gradually ousted the simpler and more primitive tools. We have an echo of this in the ancient traditional literature of Wales, where we read that a certain Elldud ' improved the mode of ploughing land . . . and gave them the system and art of cultivating land as is used at present ; for before that time land was cultivated only with the mattock and over-tread plough, after the manner of the Irish.'*

This ' over-tread plough '—literally ' plough of the instep '—is undoubtedly the *caschrom,* or foot-plough, which is still used in some parts of the islands of Skye and the outer Hebrides, and consists of a development of the digging-stick in the form of a wide-angled L. This instrument is driven into the ground by pressure of the foot upon a projecting peg, and is then used as a lever to prise up the sod, the angle being the fulcrum, and the longer limb the handle (Plate XX).

Our picture of the agricultural methods of Sussex in early times would be incomplete without reference to this implement, because there is some evidence to suggest that its use was wide-spread in western Europe at one time. The Welsh triad just quoted tells us that it was used in Wales and in Ireland. Part of an actual specimen was found in an Early Iron Age lake-dwelling at Glastonbury in Somerset. Lastly, it has been found in Brittany in recent times furnished with an attachment to enable it to be drawn by oxen as an ordinary wooden plough.

Interesting sidelights upon the thoughts and ideas of an earlier age are sometimes afforded by a study of the names given to tools and implements. In

* Probert, *Ancient Laws of Cambria,* p. 396, Triad No. 56.

describing the primitive plough-point as a 'sock' we have intentionally made use of a little-known word occasionally employed by mechanics and others to denote a metal cap that fits on the end of a shaft after the manner of a spear-head. This term is derived through the French from an old Celtic word *socc*, meaning a plough-share, or rather, plough-point, though it originally denoted a pig, being an imitation of the characteristic grunt of that animal.* The reason for the change of meaning is not difficult to trace. When the plough was first introduced and began to supersede the hoe, men naturally wanted to find a name for that part of it which tore up the ground in a long furrow, and the analogy of the pig rooting up the ground with its snout readily suggested itself, so that the plough-point was called 'the pig.' A similar conception caused the furrow itself to be named after the same animal among some peoples, so that the Romans or their ancestors, who called a pig *porcus*, called a furrow *porca*. Precisely the same relationship exists between the English words 'farrow' and 'furrow,' the former being an old word meaning a pig.

The further history of the word 'sock' is sufficiently interesting to be followed here, though it ceases to have any direct bearing on our subject. When the comic actors of Greece and Rome took to wearing heelless slippers shaped very like the metal plough-point, they seemed to have borrowed the Celtic name and called them *socci*, whence we have the English 'sock' applied to the same slipper, as when Dryden writes:

> 'Great Fletcher never treads in buskin here,
> Nor greater Jonson dares in *socks* appear.'

The further transference of the name from the leather to the silken or woollen article worn under the shoe

* Similarly the Irish *bo*, a cow, is onomatopœic, representing the 'moo' of that animal.

was an easy and obvious one. When, therefore, the male reader next ensheaths his feet in these homely garments, it is well that he should remember the humble origin of their name in the grunt of a pig! What the word will come to mean next is open to speculation.

These early farmers lived among their fields in open villages and hamlets which were generally situated on the backs of the north-and-south ridges of the hills. As they did not throw up defensive earthworks or build their huts of stone, their villages have rarely left any visible traces behind them, but the existence of a vanished settlement can always be postulated where there is a definite area covered with the lynchets of prehistoric cultivations, especially when the moles and rabbits turn up little scraps of rude pottery or crinkled flints called ' pot-boilers.' This crinkled and crackled appearance of the stones, resembling Japanese Satsuma ware, results from their having been heated red-hot in a fire and then dropped into water—a means of heating water adopted by people whose pottery vessels were not of a quality to stand the direct application of fire. The presence of ' pot-boilers,' therefore, in any numbers may generally be taken as an indication of the site of a prehistoric settlement or camping-ground. Excavation on such a site may reveal unsuspected pits like those on the Caburn, or irregular hollows where huts had stood, as in the case of Park Brow, shortly to be described.

Owing to the difficulty of discovering these settlements, very few have yet been definitely located in Sussex, while the existence of others may be taken as certain. Quite the most interesting of such sites is on Park Brow, a ridge of Downland jutting southwards from the higher hills between Steyning and Chanctonbury, and distant about a mile north-east

of Cissbury. The whole of this hill and that to the west of it are covered with the lynchets of prehistoric cultivations, and there is a very fine stretch of contemporary roadway of a type which will be described in the next chapter (see Plates XXI and XXII). The writer has known of the site since childhood as one where scraps of ancient pottery could be picked up in the molehills. Recently, however, something of the history of the place has been recovered by the excavations carried out by Messrs. H. T. Pullen-Burry and Garnet R. Wolseley, and also by the Society of Antiquaries under Col. Hawley. From their work we learn that at the southern end of the hill there stood in the closing days of the Bronze Age a group of at least eight circular huts with conical thatched roofs, and low walls made of wattles daubed with clay. They varied in diameter from 22 to 30 feet, and, but for the absence of stone, are the counterparts of the hut-circles of Dartmoor and other parts of the west of England. One of these hut-sites was completely excavated and revealed a circular floor levelled on the hill-side and containing a large number of small pits. These pits, which contained various relics of human occupation, had evidently been used for different purposes, such as for cooking and for storing earthenware vessels, mill-stones, and the like, and also for receiving posts to support the roof. In them, and on the floor, were found several fragments of saddle-querns, indicating that the inhabitants grew corn; also a spindle-whorl and loom-weights, showing that they spun and wove cloth. There were also bones of various animals, such as ox, pig, sheep, deer and wild boar. Their pottery was coarse and gritty and of two kinds —(1) a somewhat globular vessel with two handles, and ornamented with a kind of fern-leaf pattern; and (2) a severe cylindrical jar with a raised band round it, bearing a row of finger-tip impressions.

The occupants of this hamlet pursued their little round of daily life until one day, somewhere between 700 and 500 years before Christ, there arrived a band of settlers from Central Europe, bringing with them a culture which is named after a place called Hallstatt in Austria. These new-comers were the earliest Celts and they brought with them the first iron tools that had ever been seen in Britain, and also beautiful burnished red pottery, far better in quality than anything that the Bronze Age people of Park Brow had ever known. The new settlers destroyed the round huts, and built others of their own a little higher up on the hill. These new dwellings were of an entirely different type, being large, long and irregular in plan, with a gable roof supported on several pairs of strong wooden pillars. With them were associated a number of pits of various sizes, some quite large and deep, the biggest of which yielded some charred wheat—the first ancient wheat to be recorded in Sussex. The whole settlement seems to have been included in a fenced enclosure protected by a strong palisade made of baulks of timber set side by side in a trench. As the west side of this enclosure formed part of the side of the ancient road that runs the length of the ridge, it follows that this road was either made by the Hallstatt people, or was already there before they arrived. Further up this track, a little to the north of the settlement, is a large pit surrounded by a broad and massive bank, with a gap opening on to the road. This pit was a water-hole, fed by the rain-wash coming down the hollow roadway, and it served the purpose of a water-supply for the Hallstatt settlement.

The road runs up the ridge as a hollow-way between two banks, and from either side at irregular intervals lynchets take off, showing that the cultivation of these fields was contemporary with the use of the trackway. Whether these were tilled by the

Hallstatt people or by later Celtic inhabitants it is not possible to say.

In process of time these Celtic farmers moved their dwellings and settled lower down on the southern end of the ridge, in a more sheltered spot some 500 feet south of the Bronze Age hamlet. Here they left behind them the customary store-pits, and also a trench in which they deposited a considerable quantity of rubbish. By this time the Hallstatt phase of culture had passed away, and we find them enjoying that typical of the Early Iron Age, named after La Tène, a place in Switzerland—a culture which we have already described in connection with the people of the Caburn. Here their descendants were still dwelling when the Romans came. This change brought them nothing but prosperity, and by the second century we find them living in spacious rectangular cottages 25 to 30 feet long, and roofed with red tiles fastened with iron nails. The walls were constructed, like those of the earlier habitations, of wattles daubed with clay, but they possessed the luxurious addition of an inner lining of white plaster covered with red, cream and grey colour-washes. Glass windows, a substantial door-key, and the probability of a plank floor, complete the picture of a cottage not inferior to many inhabited at the present day.

The sites of five such cottages have been found. The Romanised Britons who inhabited them continued to fill the neighbouring trench with their rubbish, and then dug two more trenches converging on a deep refuse pit. All of these have yielded quantities of Roman pottery and other remains, all going to show what a high level of material comfort was attained by these native farmers under the beneficent rule of the Roman government while the latter was at the zenith of its power.

By this time the site of the Hallstatt settlement

had been completely obliterated by ploughing, and the neighbouring water-hole farther up the hill had been filled up with the chalk-wash which rain had carried down the hollow roadway. The evidence of excavation here suggests that this silted up pond may now have been used as a dump for flints gathered from the surface of the fields and other rubbish, but it looks as if the mouth of the runnel had been intentionally closed with large flints and earth in order to prevent further rainwash entering the hollow. It is unwise to be dogmatic, and the point has been controverted, but it is possible that this old pond came to be used by the Romanised Britons as a central place of meeting, or 'Circus,' for the inhabitants of scattered hamlets in the district. The reason for thinking this lies in the discovery of a circumscribed collection of a large number of small fragments of Roman pottery, blackened by charcoal, lying in the mould covering the chalk-wash in the centre of the hollow—a discovery of which the writer was an eye-witness. Though many fragments were found elsewhere above the chalk-wash, this localised collection is strongly suggestive of a 'ritual deposit' such as we have described as having sometimes been found in the centres of Circi and the larger stone circles (see Chapter III). A very similar collection of shards was found in the undoubted Circus on Buckland Bank, near Falmer, and this lends colour to the view that the old pond on Park Brow may have been put to a similar use in Roman times.

But alas for the prosperity of these Romano-British farmers! As the power of Rome waned the raids of the ferocious Saxon pirates became more and more frequent, and the sunny farms and villages of the Sussex Downs were frequently reduced to ashes and plundered by the bloodthirsty pagans. This seems to have been the fate of the farmers of Park Brow, for of the homes we have been describing nothing

was left but charred oak, burnt daub, molten window-glass, and broken tiles.

So ends the history of the Park Brow Settlement. With the passing of the Celt the cornfields have given place to a wilderness of thorn and bramble and furze, a play-ground for rabbits and pasture for sheep, where you may still find solitude nor ever meet a human being for miles together.

CULTIVATION-AREAS AND VILLAGES

A. Probable Bronze Age Village :
Plumpton Plain : 6 in. O.S., 53, N.E. Consists of three round and one rectangular enclosure, surrounded by banks without ditches ; also five pits and traces of a contemporary roadway. No cultivations at present visible. Described in *Sussex Arch. Coll.*, LXVIII, pp. 178-185 (H. S. Toms).

B. Lynchet Areas (500 B.C.–A.D. 500) :
N.B.—Lynchets are common in almost all parts of the Downs, but are not usually marked on the 6 in. O.S. maps. Specially extensive or interesting areas of these prehistoric cultivations are detailed below.

Eastbourne District :

1. Jevington, on hill east of village ; 6 in. O.S., 79, N.E. Some of the terraces are unusually long, and may have been transversely divided by boundaries that have not survived. Contemporary settlement not yet found. Sketch-view and plan in *S.A.C.*, LXIV, pp. 2, 51. See air-photo, *Antiquity*, I, Plate v, f.p. 281.
2. Windover Hill, on S.W. spur (called Ewe Dene Down), Wilmington parish ; 6 in. O.S., 79, N.E. A fine series of Celtic lynchets, with traces of a road running along the back of the ridge. There are three barrows on the edges of lynchets, but site of settlement not yet found. See air-photo, Plate XXIII.
3. Fore Down and Old Kiln Bottom, about a mile S. of the foregoing ; 6 in. O.S., 79, N.E. A fine series of similar lynchets, with contemporary road on Fore

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PLATE XXII

PARK BROW, SOMPTING.

An oblique aerial view from the south showing early Iron Age cultivation banks (lynchets) and a contemporary road winding down the left of the picture (cf. plan, Plate XXI).

Down. Close to Winchester's pond, on its east side, are some pits which, when excavated by the Rev. W. Budgen, yielded remains of Hallstatt period (*c.* 700-500 B.C.), but these appear to have been ploughed over by the cultivators of the lynchets. See air-photo, *Antiquity*, I, Plate IV, f.p. 278.

Seaford District :

4. DENTON HILL : 6 in. O.S., 67, S.E.

Lewes District :

5. CLIFFE HILL and SAXON DOWN : 6 in. O.S., 54, S.W. and S.E. No contemporary settlement found as yet, unless it be the hill-city on Mt. Caburn, a mile to the S. Lynchets on Saxon Down planned by Mr. Reginald Blaker, *S.A.C.*, XLV, pp. 198-203. There is a piece of contemporary road running between lynchets up Cliffe Hill.

Brighton District :

6 BUCKLAND BANK, Falmer parish ; 6 in. O.S., 53, S.E. A remarkable series of terraced cultivations, probably of the Roman period. The series extends westwards towards Balmer. The settlement probably stood on the back of the ridge, ½ mile S.E. of Four Lords' Burgh, the site being covered by a racehorse training gallop. There is a considerable quantity of Romano-British pottery under the turf in that area. A line of contemporary road runs most of the length of the ridge, and a branch runs westwards across the valley (Buckland Hole), the junction of the two roads being marked by a barrow. On the course of the first road, 100 yards N.W. of the supposed site of the settlement, is a large embanked pit of somewhat semi-circular form, with entrances to N. and S., through which the road runs. This is the best Sussex example of a ' Circus,' or meeting-place of the village community (see Chapter III). Excavation revealed that in the centre was a deposit (probably a ritual deposit) of small fragments of Roman pottery, while drainage ditches, unsuspected on the surface, led up to and stopped short of both entrances, apparently with a view to the prevention of rain-water washing into the Circus. This

Circus is comparable with a similar but larger example adjoining the Romano-British village of Woodcutts on Cranborne Chase, Dorset (Pitt Rivers, *Excavations*, II, Plate iii). In the head of the valley to the W. (Buckland Hole) is the site of a Romano-Belgic cemetery still marked by the greater part of a circle of bracken-fern, 45 yards in diameter. In 1849 urns were found here, containing cremated human remains, also small vases, a glass lachrymatory or tear-bottle, and fragments of iron (*S.A.C.*, XVIII, pp. 65, 67). The interments were all in the S. half of the cemetery, a feature which is frequently observed in old country churchyards (Walter Johnson, *Byways in British Archæology*, pp. 341-357; cf. Rice Holmes, *Ancient Britain*, p. 188). References: Lynchets, *S.A.C.*, LXIV, pp. 35-40, 55-6; Circus, *Brighton and Hove Archæologist*, II, pp. 29-40; III, pp. 62-74 (with plan); *Sussex Notes and Queries*, I, pp. 244-6.

7. Park Bottom (near Brighton), on W. side of Ditchling Road, W. of Hollingbury Camp; 6 in. O.S., 53, S.W. and 66, N.W. A fine series of lynchets, extending northwards into Eastwick Bottom, where is a good piece of contemporary road, and a small area in which pottery is found in mole-hills. Described by H. S. Toms, *The Antiquary*, November, 1911, pp. 411-7.
8. Tenantry Hill, 1-2 miles S.W. of the Dyke: 6 in. O.S., 52, S.W. and S.E. Lynchets with piece of contemporary road, wrongly marked on some maps as 'Roman Encampment.'
9. Truleigh Hill, on S.E. spur, between Summersdean Farm and Bushy Bottom: 6 in. O.S., 52, S.W. Lynchets with fine piece of contemporary road (with branches) leading up the ridge to a place where there are shallow pits with pottery to be found in the mole-hills—the probable site of the settlement. Described by Reginald Williamson, *Brighton and Hove Archæologist*, II, pp. 54-6.
10. Thundersbarrow Hill: 6 in. O.S., 65, N.W. A series of lynchets in the neighbourhood of the Camp, possibly cultivated by the inhabitants of the latter. A remarkable group to the S. of the Camp, called 'Thunder's

Steps ' or ' The Giant's Steps ' surveyed and described by Messrs. Gurd, Jacobs and Toms in *Brighton and Hove Arch.*, II, pp. 81-6. Many of the lynchets on the W. side of the hill have been almost obliterated by military trenches dug during the War (1914-18) and never refilled.

Worthing District :

11. Park Brow, Sompting parish : 6 in. O.S., 51, S.E. This fine series of lynchets, together with road and three prehistoric settlements, has been described above (pp. 87-92). References: Lynchets, *S.A.C.*, LXIV, pp. 30-35, 54-5 ; Circus, *S.A.C.*, LXV, pp. 242-250 ; LXVI, p. 170 ; Late Bronze Age settlement, *S.A.C.*, LXV, pp. 251-3 ; *Archæologia*, LXXVI, pp. 1-6 ; Hallstatt settlement, *Antiq. Journ.*, IV, pp. 347-359 ; *Archæologia*, LXXVI, pp. 30-40 ; Late Celtic and Roman settlement, *ibid.*, pp. 6-9 ; conclusions and comparisons, *ibid.*, pp. 10-29.
12. Findon Park, just S. of Dead Man's Clump : 6 in. O.S., 51, S.W. A group of eleven storage pits in a lynchet area. Excavated by Dr. Cyril Fox, F.S.A., and Mr. Garnet Wolseley and proved to belong to the Early Iron Age (La Tène I and II, 300-100 B.C.). Described in *Antiq. Journ.*, VIII, pp. 449-460.
13. Kithurst Hill, about 1 mile S. of Storrington : 6 in. O.S., 50, N.E. A good series of large lynchets on the S. slopes, with contemporary road running along the spur (Middle Brow). The site of the settlement is probably indicated by the remains of a rectangular earthwork and an area of pottery shards just N. of the isolated pine trees N. of the square pond. The settlement was probably Romano-British. Described in *S.A.C.*, LXIV, pp. 9-30, with plans.

Arundel District :

14. Wepham Down and Lowsdean, about $1\frac{1}{2}$ miles E. of Burpham : 6 in. O.S., 50, S.E. There is a faintly marked stretch of contemporary road across the valley. See *S.A.C.*, LXIII, p. 21.
15. Amberley Mount and Rackham Hill (near Amberley), on slopes of valleys to the S. : 6 in. O.S., 50, N.W. and N.E.

16. Arundel Park, Offham Down (N. of Swanbourne Lake) : 6 in. O.S., 50, S.W. There is also a good stretch of contemporary road, and traces of a Romano-British settlement on the brow N. of the W. end of the lake.

Chichester District :

17. East Dean Wood, 1½ miles S. of Graffham : 6 in. O.S., 35, S.W. There is a stretch of contemporary road in the Wood, with lynchets on the open Downland to the S.
18. Bow Hill, at the foot of the eastern slope, towards Dean Cottages, Binderton : 6 in. O.S., 48, N.W. A pre-Roman road runs from the neighbourhood of the cottages towards the hill westwards, and then ascends towards N.W. There are lynchets but no definite trace of a settlement. There is, however, a structure by the roadside strongly suggestive of a Circus with a large mound on the east side of it. Excavation here by the author showed that (1) the road was pre-Roman ; (2) drainage ditches had been added to it on either side in Roman times to prevent the road becoming a water-gully ; to a large extent these ditches are not visible on the surface ; (3) the mound is pre-Roman ; (4) the supposed Circus was probably added in Roman times ; (5) the drainage ditches are arranged so as to avoid the Circus and not to feed it with water ; (6) the supposed Circus was never a pond, but no ' ritual deposit ' was found. See *S.A.C.*, LXVI, pp. 163-171.

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1. Sussex Lynchets and Field-ways, *S.A.C.*, LXIV, pp. 1-65.
2. ' Prehistoric Agriculture in Britain,' *Antiquity*, I, pp. 261-289.
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4. E. Cecil Curwen, *Air-Photography and Economic History : the Evolution of the Cornfield*, Economic History Society's Bibliographies and Pamphlets, No. 2 (Students' Bookshops Ltd., London School of Economics, Houghton Street, Aldwych, W.C.2).

Air-Photograph by H.M. Ordnance Survey, by permission of the Controller of H.M. Stationery Office

PLATE XXIII

PREHISTORIC CELTIC FIELDS, WINDOVER HILL.

Note the four small round barrows scattered among the fields.

Chapter VI

ROMAN AND PREHISTORIC ROADS

Oft have I roamed wild Bignor's heath
And scanned the Roman way beneath ;
Oft, stretched upon its grassy bank,
Watched the grey clouds come, rank on rank,
From their dark home o'er Vectis' isle,
Past Chichester's Cathedral pile,
O'er Halnaker's whin-golden hill,
Crowned with its time-worn, ruined mill ;
In silence mustering their array
Along the ancient Roman way,
As if the ghosts of the Roman dead
Still marched in the storm-clouds overhead.

Storm Street—*a fragment.*

There is a peculiar fascination in tracing out the ways by which men journeyed in olden time. Of all ancient things a road seems to possess character and personality, for it undergoes little or no change during the centuries, and seems to perpetuate the motives and characteristics of those who first made it. Watch, for instance, how an old road meets its difficulties—how it surmounts the hills and negotiates the valleys ; if made by the Romans, it may take hill and dale in its unswerving course, for the dogged Roman cared very little for such trifles. In the prehistoric trail, on the other hand, which clings to the hill-tops and winds inconsequently up and down the slopes, taking the easiest gradients, we see primitive man's love of beauty and space and freedom and lack of hurry, and that appreciation of the grace of curved lines which

has made Celtic art unmatched throughout the world. We can well imagine the pain with which the sensitive and artistic Britons beheld the unyielding straightness of the new roads built by the Roman government.

It is a fascinating study, and one that is within the reach of all who have the opportunity of taking country walks. But here as elsewhere there has been much quackery, and there have been those who would bring forward all manner of theories unsupported by any real evidence. In all our study of roads our conclusions will be worthless unless they are supported either by definite evidence or at least by good reasons for our belief.

What constitutes evidence of the antiquity of a road? It is a fair presumption that most of the earliest roads kept to the tops of the ridges, but while admitting the probable antiquity of these 'ridgeways,' we need to find something definite in the way of criteria by which to judge the age of both these and other tracks. Such criteria do not always afford absolute proof individually, but the accumulation of presumptive evidence leaves very little room for doubt. The most important key to the study is that which was described in an earlier chapter, namely, the complete break of continuity that occurred at the Saxon conquest. This resulted in (1) a shifting of the centres of population from the Downs to the Weald; and (2) a change from the Celtic to the English field-system, the characteristics of which have already been described.

The principal question, therefore, to be settled first of all in regard to a road is: did it come into being before or after the Saxon Conquest? In other words, did it supply the needs of Roman towns and Celtic hill-settlements, or of Saxon manors in the lowlands? This question can sometimes be conclusively answered by observing the relation of the road to any field-

systems through which it may pass. This may, perhaps, be best illustrated by concrete examples.

(1) We have already referred to the road which runs along the ridge of Park Brow, near Sompting (Plates XXI and XXII). On the back of the ridge, where the ground is relatively level from side to side, this road presents the form of a slightly sunken way between two banks on either side of which lie the old Celtic fields. The fact that the lynchets and field-banks run off to right and left from the road-banks at irregular intervals, not opposite to one another, shows that the road is at least as old as the fields, and may be much older. Indeed, it probably represents an old ridge-way trail of immemorial antiquity, which has been embanked in that part of its extent which lies between fields.

Further south, where this road begins to descend the end of the hill obliquely, there is a slight fall of the ground in a direction at right angles to that of the road. Consequently we find that the banks disappear and are replaced by scarps or lynchets, one above and one below the track.* The lynchet above† consists of plough-soil that has accumulated at the foot of the field above ; the scarp below the road‡ has been formed by the denudation of soil from the upper edge of the field below—soil which has travelled down to form another lynchet further down the hill. This shows again that these fields must have been originally laid out in such a manner as to leave room for the roadway between them, and this confirms our finding that the latter must have been at least as old as the fields, if not older. If, therefore, the fields are of Celtic type and dimensions, then we know for certain that the road was in use at least as early as Celtic times.

* This type of road is spoken of as a *double-lynchet* track for convenience.
† Called a *positive* lynchet.
‡ Called a *negative* lynchet.

(2) In many parts of Sussex, particularly in the Weald and on the coastal plain, some of the roads and lanes in everyday use in the proximity of old English manors and villages are found to make numerous right-angled bends in order to circumvent the fields—whether arable or pasture—belonging to that village. On reflection it is obvious that these roads cannot be older than the fields, but must either have been laid out at the same time or have come into being later. If, therefore, the fields in question are typically the quondam furlongs of the old open-field system now enclosed by hedges—the field-system characteristic of English manors ever since the Saxon conquest—it follows that the lanes in question did not exist before that event, but may have come into being at any subsequent date.

These examples will illustrate what is almost the only absolute test by which pre-Saxon and Saxon (or post-Saxon) roads may be distinguished. We hardly need a test to distinguish the well-known Roman roads which traverse many miles of country without deviating from the straight line, and which connect the sites of Roman towns and cities. But such grand roads were comparatively few, and were by no means the only ones in existence at the time. They owed their origin to a foreign government and were built for government purposes, and they belong to an early phase of the Roman occupation, for their authors soon grew tired of this outburst of road-making activity and were content to allow their later towns, as Anderida (Pevensey), to depend upon improved native trails for their communications.

A difficulty sometimes arises in determining whether or not a straight road is to be attributed to the Romans. It may be taken as an axiom that a perfectly straight road is either Roman or modern, for straightness implies engineering, an art which was not applied to road-making after the departure of the

Photographs] [*E. C. C.*

PLATE XXIV

1. The Terrace-way of Stane Street descending Bignor Hill.
2. Terrace-way of Roman type, Steyning Round Hill.
3. 'Port's Road,' a 'double-lynchet' road (pre-Roman) on the Brighton and Hove Golf Links.

Romans until a little more than a century ago. If the road runs between enclosed fields something may be learned from the way it behaves in relation to the hedges. If the latter constantly branch off to right and left exactly opposite one another, it is evident that the road has breached pre-existing lines of hedges, and must therefore be later than the fields, and hence modern.* This relationship is seen most clearly on the 6 in. O.S. map. If, on the other hand, the hedges branch off at irregular intervals, not opposite one another, the probability is that the road is older than the fields, and this may make one suspect a Roman origin.

Sussex possesses one paramount example of this type of Roman road. Starting from the east gate of the old Romano-Belgic city of Regnum (Chichester), Stane Street makes the journey of 55 miles to London in a few stretches of undeviating straightness, a great part of which is still used as a modern highway.

We have already seen that Chichester was probably founded by the Belgae about a century before the Roman conquest. The second century geographer, Ptolemy, gives its name as Noviomagus, but it was also called Regnum, being the capital of the tribe of the Regni. Its polygonal plan, perpetuated by the Roman and medieval walls, is believed to be a feature of Belgic work, and may be compared with that of Calleva Atrebatum, or Silchester in Berkshire, a Romano-Belgic city which has an archæological advantage over Chichester in that it was never rebuilt after its destruction by the Saxons.

On the other hand, Chichester seems to be the oldest site still inhabited in Sussex—probably the only one that has been dwelt in continuously for two thousand years. About the middle of the first century, during the reign of the British chief Cogidub-

* A good example may be seen on the main Lewes-Eastbourne road for the half-mile immediately west of Wilmington village (6 in O.S. 68 S.E.).

nus, who ruled by authority of the Emperor Claudius, one Pudens gave a plot of ground for the erection of a temple to Neptune and Minerva. This fact is recorded in an inscription preserved in the wall of the Council House, on the site of which it was found.

It is to the Romans that Chichester owes its two main streets intersecting the city at right angles. This was a regular feature of many Roman towns, and these roads led out into the country by four gates, facing the four points of the compass. We have already seen how Stane Street left the city by the east gate and immediately turned north-eastwards for London. At intervals of about 12 to 13 miles along its route were *mansiones*, or rest-houses, comprising barracks for the road-patrols, and accommodation for travellers and their horses and carts. There were four such hostelries between Chichester and London, two of which, at Hardham near Pulborough, and Alfoldean near Horsham, fall within the limits of Sussex. Both of these have been partially excavated by Mr. S. E. Winbolt with results that throw light on the date of the road. The station at Hardham flourished between the middle of the first and the middle of the second centuries and was then abandoned, probably in favour of a better site on the higher ground close to the spot where Pulborough Church now stands. That at Alfoldean was inhabited from the end of the first century for some 275 years, that is, during the greater part of the Roman occupation. We thus see that the construction of Stane Street must at least have been begun during the latter half of the first century.

It is necessary here to enter a protest against the view that has sometimes been put forward that Stane Street follows the line of an earlier British track. In the author's opinion nothing could be less probable, seeing that the course taken by the Roman road is totally unlike in character that of any known Celtic

trail. The line taken from Chichester to negotiate the ridge of the Downs is certainly the easiest possible, but its success depends entirely on the consummate skill of the Roman surveyors. Celtic roads were not laid out by surveyors, consequently they met nature's obstacles by taking a sinuous course. Besides, there was no particular reason why the Celtic inhabitants of Chichester and London should want to communicate with one another across so great and so dangerous a forest as that of the Weald. We must not think of pre-Roman London as the capital of a united Britain as it is to-day.

The most interesting piece of Stane Street in the whole of its course is to be seen on Bignor Hill and Glatting Down, just before it descends from the Downs to the Weald. Here it must have gone out of use with the departure of the Romans, so that one can easily see its original shape, time-worn and grass-grown, but unspoilt by subsequent use or destruction. Standing on its raised bank, or *agger*, and looking towards the south-west, one can see the road making straight as an arrow over hill and dale for the spire of Chichester Cathedral.

But the interest of this part of the road lies chiefly in the fact that it is believed to be the widest piece of Roman road anywhere in the world. It consists here of three parallel roadways; two of them are metalled, each 25 ft. wide, while between them is a narrow road 3 or 4 ft. wide on a high bank, or *agger*. The total width of the whole, including the slopes of the *agger* and the flanking ditches, is 93 ft. This triple roadway is almost unique and can only be paralleled by the Ackling Dyke, a Roman road in Cranborne Chase, Dorset, which presents the same features, but is only 87 ft. wide.*

When Stane Street begins to descend the steep north escarpment of Bignor Hill its form changes and

* Pitt Rivers, *Excavations in Cranborne Chase*, III, facing p. 74

the three roads merge in one terrace-way, from 20 to 35 ft. wide, which has been carefully engineered by cutting back the steep hillside and throwing the soil downwards to form a ledge (Plate XXIV, 1). This terrace has, unfortunately, been largely destroyed by the passage of farm-carts in recent years, for when the smooth turf is broken the rain gets in and soon washes out a gully. Near the bottom of the hill another terrace-way branches off in the direction of the Roman villa at Bignor, but is lost in the ploughed land.

The Bignor villa was the second largest Roman villa in Britain. It was originally the palatial residence of some important Roman official, built about A.D. 80, or about the same time as the construction of Stane Street. Who the official was we do not know, but it has been suggested that it was the British chief Cogidubnus, who held the office of legate under the Emperor Claudius. The building itself consisted of two large courtyards, the inner one surrounded by rooms, many of which were paved with beautiful mosaic pavements. None of the actual buildings have survived, but some of the pavements may still be seen, being protected from the weather by shelters erected over them. Their designs represent many and various scenes, as the Four Seasons, gladiators fighting, Juno and her peacocks, the Rape of Ganymede, and the Head of Medusa. Besides these there may still be seen the cold plunge bath of which the Romans were so fond.

The name 'Stane Street' means 'Stone Street,' and has reference to the way in which the road was constructed in the Weald. 'Street' is derived from the Latin *stratum*, meaning something laid down in layers—an illuminating sidelight on the Saxon's innocence of anything like the art of road-making, or they would not have needed to borrow a Latin word to indicate a *made* road! How aptly the name

characterises this monument of Roman engineering is shown by a section Mr. Winbolt cut through the road at the Roman station at Alfoldean. This revealed that the ' street ' was made up in three principal layers of various kinds of stone, 20 ft. wide. Lowermost was a layer of gravel with pebbles and ragstone ; on this was a double layer of biggish slabs of local stone ; finally, on top of all was a band of hard and heavy chert-stones, with flints and seashore pebbles.

At Rowhook, one mile north of Alfoldean, a branch road left Stane Street and ran north-west towards the Roman station on Farley Heath, near Wonersh, Surrey. Its line is accurately shown in the Ordnance Survey maps, but the chief point of interest is the completeness with which this Roman road has vanished from the countryside. In all its length there is scarcely so much as a field-hedge coinciding with its course, much less a modern road or lane. Mr. Winbolt has traced out several miles of its course by digging and sounding, and has established the accuracy of its representation on the maps.

We have seen that Roman Chichester had four gates, and we have so far traced only one road leading from the east gate. A way also called ' Stane Street ' in a Saxon Charter of the year 930,* ran southwards from the south gate by Kingsham, but little or nothing is known of its further course. The need for such a road is shown by the profusion of Roman remains that have been discovered in the Selsey neighbourhood. In this peninsula flourished an important trading population during the couple of centuries immediately preceding the advent of the Romans. The principal industry seems to have been gold-working, for quantities of Celtic gold ornaments have from time to time been brought to light by the fury of the waves. Hundreds of British gold coins, dating from

* Birch, *Cartularium Saxonicum*, II, pp. 348-9.

150 B.C. to A.D. 50, have also been picked up, many of them bearing the names of the British Chief Commius and of his three sons, Tincommius, Verica and Epillus, who flourished between 50 B.C. and A.D. 50. Another interesting and unique discovery at Selsey consists in a number of Greek or Etrusco-Roman vases, dating from the fourth and fifth centuries before Christ. They probably formed part of a Roman officer's collection of 'antiques.'*

Another Roman road, originally similar in character to the great thoroughfare we have been describing, ran from the west gate substantially along the line of the present main road by Fishbourne and Emsworth to Havant. Thence it parts company with the modern road and made a direct line for Wickham, where it divided, one branch going to Winchester and one to Bitterne (Clausentum), near Southampton. The Roman fortress-town of Portus Magnus or Portus Adurni (Porchester Castle) came into existence after these early straight roads were laid out, and hence was forced to depend upon other and perhaps later tracks.

There remains to consider whether another road besides Stane Street left the east gate of Chichester in an easterly direction. A glance at the one-inch Ordnance Survey map will show that the villages of Lyminster, Poling and Angmering are all situated in a line, and that what appear to be the traces of an old straight road, represented by lanes and footpaths, runs through these three villages in a line that makes for a point about a mile north of Chichester. On this line of road, between Angmering and Poling, and just east of the Black Ditch, is the site of some Roman buildings, and Mr. Winbolt has by digging discovered here what looks like the core of a Roman road under

* E. Heron-Allen, *Selsey Bill: Historic and Prehistoric* (Duckworth, 1911), pp. 78, 85, 329.

the present lane. As these Roman remains are very much the same distance from Chichester as the 'rest-house' at Hardham on Stane Street, it looks as if they may represent another such rest-house, or *mansio*, on a road running eastwards from Chichester. Between that city and Lyminster, however, no trace of such a road has yet been found, but the complete disappearance of the Rowhook-Farley Heath road, alluded to above, leaves one a reasonable hope that this gap may yet be bridged by careful search. One would seek it in the line of Tortington, Eastergate, Aldingbourne and Oving—villages that may once have marked its course.

Where did this eastern road lead if it ever existed? There are no early Roman towns east of Chichester until you come to Lympne in Kent, some eighty miles distant. Anderida (Pevensey Castle) was not built till the fourth century. It is possible that this road was part of a scheme begun but never completed. It is also possible that there may have been a Roman or British town at the mouth of the Adur (*not* Portus Adurni),* and that this has been destroyed by the sea. But the whole of the coastal plain is dotted over with Roman remains, fresh finds being recorded almost annually, and it may be that the road was designed to serve these sites as a whole. One cannot be certain that it may not have merged with native trails such as those which abound in the neighbourhood of Portslade.

It was upon Romanised native trails that the Romans learnt to depend during the later years of their rule in this island. Such may have been the road which is said to have run south from London to Hassocks, the exact course of which is not yet certain except in a few places. The objective of this

* The Adur was formerly called the Bramber Water, and was christened 'Adur' by Michael Drayton (Polyolbion, XVII. 431) on the assumption of Camden that Portus Adurni was situated at its mouth. See *S.A.C.*, XXXVIII, p. 217.

road, if it ever existed,* would have been to provide direct communication between London and the scattered agricultural villages of the South Downs, and not to lead to any one single town. It would be an outstanding example of the way in which the later Romans linked up and improved some of the very numerous native tracks with which the south of Sussex was networked. They made terrace-ways on the sides of the steep hills, and causeways across the low-lying marshlands, and occasionally laid a metalled road-bed or dug lateral drainage ditches.

Throughout the whole length of the Downs tracks may be seen descending the steep north escarpment obliquely. These are in some parts called ' borstals,' often erroneously spelt and pronounced ' bostal,' a word of uncertain origin, of which the most plausible derivation would connect it with two Old English words meaning ' a hill ' and ' to steal or go sideways,' thus indicating a road which goes sideways or obliquely up a hill. Borstals are usually either deeply sunk hollow-ways or else smooth green terraces, and are very numerous all along the steep north face of the chalk hills (Plate XXIV, 2).

The classical example of a turf-covered terrace-road is that of Stane Street as it descends the north face of Bignor Hill, as already described. It has been laid out by surveyors and definitely and purposely *made*, and is not the result of mere wear and tear of travellers. Another classical example, called the Rabbit Walk, descends Firle Beacon in the direction of Firle Place. This is not so wide as the terrace of Stane Street, but it is continued on the top of the hill, near the barrows called Firle Lords' Burghs, as a cambered road between ditches, which Mr. Allcroft has proved by excavation to be Roman. In the other direction the Rabbit Walk was continued towards

* Mr. S. E. Winbolt has recently cast doubt on the previously assumed course of this road. See *Sussex Notes and Queries*, II, pp. 1-5.

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PLATE XXV

Chanctonbury Ring.

An oblique aerial view looking east and showing in the left foreground the clump of trees within which is the prehistoric camp and the site of a Romano-British Temple. Just beyond the trees are three small barrows. Curving round the dew-pond in the middle distance is an earthwork of 'covered-way' type

Glynde Place, and crossed the marshy meadows of the Glynde Reach by means of a substantial causeway which may still be seen.

With these signs of Roman work there is very little doubt of the Roman origin of the Rabbit Walk itself. Its characteristics are important to notice, though since it was first described by Mr. Allcroft it has unfortunately been damaged by cavalry during the War. (1) The gradient is even and does not greatly vary,* being about one in five ; (2) it has been constructed by cutting back the hillside and throwing the chalk downwards to form a ledge ; (3) its width is about eight feet more or less ; and (4) there is a slight slope downwards from the inner to the outer edge of the ledge, designed to let the rain-water run off and so to prevent it from scouring out a gully.

Terrace-ways answering to this description are very numerous, and probably many of the hollow-ways still used by carts and farm-horses began life as terraces. As long as the turf remains intact the terrace is preserved, but once nature's covering is broken by hoofs or wheel-ruts the rain gets in and rapidly forms a gully which becomes a hollow-way. This process has been observed during the last fifteen years on the terrace of Stane Street.

At Harting in the far west of the county is to be seen another splendid example of a green terrace road, called the Miller's Walk. Though a windmill once stood on Beacon Hill, no miller ever made such a road for his private accommodation. Its Roman origin is confirmed by its continuation eastwards on Harting Down as a cambered road between ditches, 23 feet wide, and this leads by a second terrace up into the camp on Beacon Hill.

Taking these terrace-ways as a whole, the criteria

* Minor variations in gradient occur in some terrace-ways that otherwise answer to this type. This depends on the degree of care used in the engineering.

for determining their date are mainly two : (1) Have they been engineered ? It is practically certain that with rare exceptions the deliberate building of a road was not practised after the departure of the Romans until recent times ; (2) Do they fit in best with the Celtic road-system of the Downs or with the English system of the Weald ?

This latter point requires some consideration. If we bear in mind what has already been said about the distinctions between the upland Celts and the lowland English, it becomes clear that roads leading up the face of the escarpment may have been constructed for either of two purposes : (1) for the Downland Britons to reach the forests of the Weald for such purposes as hunting or feeding swine ; or (2) for the English dwelling in the Wealden manors to reach the Downs for the purpose of grazing sheep.

In the case of the latter alternative one would expect the borstals to connect up with the lanes belonging to the English manors at the foot of the Downs—lanes which are substantially the same as those in present use ; but it is very possible that many such borstals had originated with an earlier Downland race and had continued to be used by the Saxons.

If, however, a terrace loses itself at the foot of the hill and does not connect up with any lanes at present in use, the great probability is that it is pre-Saxon in origin. If in addition it shows signs of having been engineered, its Roman origin may be regarded as certain, though terrace-ways can rarely be connected up with Roman or Celtic roads on the top of the Downs owing to the fact that it was only when such roads passed through cultivated land that they took a form that remains traceable at the present day.

This leads us to a consideration of the roads that led along the tops of the ridges, and also of that long lane that straggles along under the foot of the

escarpment throughout the whole of its length from Eastbourne to the Hampshire border, and which may for convenience be called the ' Underhill Road.'

It is a natural assumption that the earliest trails would keep to the tops of the ridges and avoid as far as possible the valleys in which unknown dangers might lurk. Where possible, however, we need in our studies to find something better than assumptions, and in this case there are one or two indications that suggest that this particular assumption may be correct. In the first place, wherever we find roads of the Celtic period running between contemporary fields, they almost always run along the backs of the ridges. This suggests that they had been ridgeways and had been demarcated by banks where they ran between fields, while remaining mere green trails in the open pasture country.

A second reason for believing that most of the ridges carried trails lies in the fact that barrows were commonly placed beside roads. Where, therefore, strings of barrows are found along the back of a ridge it is a legitimate inference that a road of some sort once lay beside them.

Ridgeways were not confined to the Downland area. We have seen what a large number of prehistoric borstals led down to the Weald, and if the Britons found need for so many roads to reach the forest they must have had numerous trails through it as well. Here more than ever the ridges would afford the surest and driest going, and it is noticeable that nearly all the ridges of the Weald carry roads at the present day along their backs. These roads probably owe their origin to the trails used by the prehistoric peoples of the Downs for the purposes of hunting, feeding swine, and conveying ore from the iron-mines of the Ashdown Forest.

The main prehistoric route of Sussex was undoubtedly along the crest of the Downs extending

for fifty miles from Hampshire to Beachy Head. It probably had no single objective at either end, but served to link up all the little local byways on which the agricultural villages were situated. It thus resembles the great prehistoric trail of the Icknield Way where it traverses the crest of the Berkshire Downs, and to some extent also the Pilgrims' Way in Surrey. Now the Icknield Way in Berkshire has the peculiarity of being double : one road traverses the hill-tops while a parallel road keeps close to the foot of the escarpment, very much as does the Pilgrims' Way in relation to the North Downs in Surrey. Was the ' Underhill Road ' in Sussex an analogous prehistoric trail ?

A careful examination of the course of this fifty-mile straggling lane—or at least of those parts which survive, for much that once existed has either been ploughed out or survives only as a footpath—will reveal that it is not strictly a continuous entity. Where, for instance, the escarpment bends or is broken by rivers, this lane, obviously ancient and sometimes deeply sunk below the ground, tends to break up into a network of deeply-sunk lanes evidently connected with the out-lay of the fields of the various manors on its route. This is enough to show that the ' Underhill Road ' is not older than those manors. If, moreover, we take a map of Sussex and put pins into all the manors mentioned in Domesday Book, and also into all the villages bearing obviously early Saxon names, we shall have a fairly serviceable map of the manors of Saxon Sussex. One of the results of such a task would be the discovery that the Saxons planted a line of manors right under the escarpment of the Downs, averaging about a mile apart from one another. Now Saxon manors were self-contained and self-supporting economic units ; the serfs were bound to the soil and not allowed to leave ; consequently there was

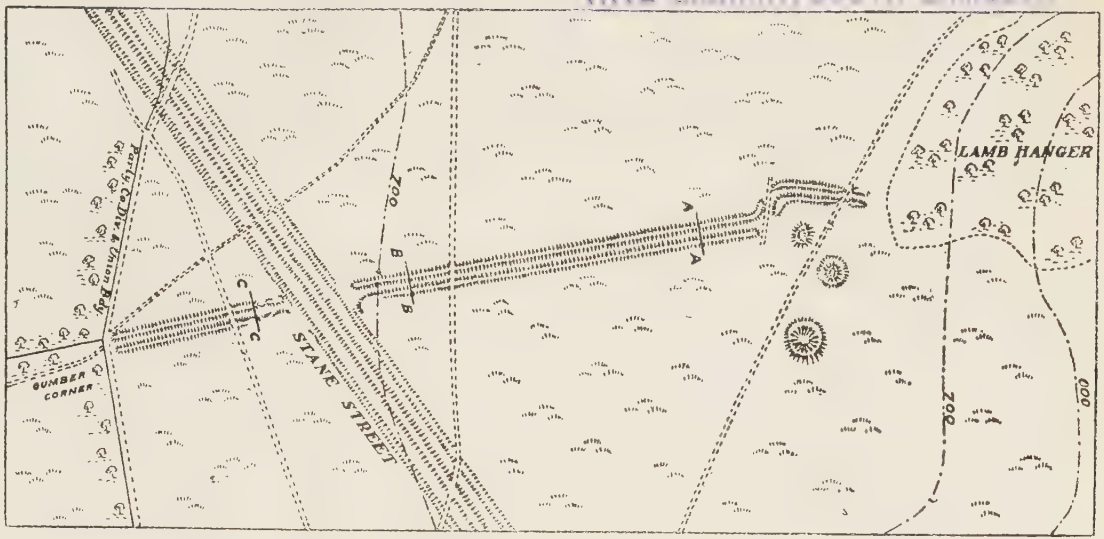

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PLATE XXVI

'Covered Way' on Glatting Down, breached by Stane Street.
Note the double bend in the former and the triple formation of the latter.

extremely little scope for long-distance travel, and no need for roads except such as would take men to their work in the fields, or at most enable them to visit a neighbouring manor. The secret of the 'Underhill Road,' therefore, lies in this chain of manors; it never was an entity, but consisted of a string of local lanes connecting adjacent manors, and consequently cannot be older than the Saxon Conquest.

The fact that English manors were self-contained agricultural communities, and not trading centres, explains why they were, more often than not, situated away from the existing main roads. The latter were mainly used by armies on the march, a species of visitation for which agricultural settlements would have little love.

There is a class of earthwork which must be considered under the heading of roads. It consists characteristically of a ditch between two broad and high banks, running athwart a ridge of the Downs, and so connecting the heads of two valleys. These earthworks are not very numerous, and are commoner in West than in East Sussex. The solution of the problem of their purpose is not to be lightly assumed until all the available specimens have been studied, for we shall then find that the most 'obvious' solution, viz., that they were constructed to bar the passage along the ridge, will not by any means explain all the features of these curious earthworks. There are three peculiar features which are met with in some individual instances: (1) occasionally two or even three of these ditches run side by side across a ridge, each between its own pair of banks, and sometimes covered by defensive ramparts in addition. Their arrangement is not one that is best calculated for defence, nor is the situation of the earthworks generally the most suitable for such a purpose. This feature may be seen on Upwaltham

Hill, Heyshott Down, and Harting Down (Plate XXVII). (2) Sometimes a faint terrace-path emerges from one end of the ditch and descends the steep hill obliquely. This is an indication that the ditch has been used as a path, and examples may be seen on Harting Down, Glatting Down, and Highden Hill. In the last-named case the terrace-way runs between contemporary Celtic cultivations. (3) In at least three instances the earthwork makes a slight double bend at a point on its course, this bend probably marking the spot where the ridgeway was allowed to cross it, though the reason for the bend is not obvious. Examples may be seen on Bury Hill, Glatting Down (Plate XXVI), and Upwaltham Hill.

The antiquity of this class of earthwork is indicated by the fact that the example on Glatting Down is completely breached by the triple roadway of Stane Street (Plate XXVI), while a section dug through it revealed late Bronze Age pottery near the bottom of the ditch. The terrace-way, too, already described as issuing from the south end of the ditch of the Highden Hill example, was in use contemporaneously with the cultivation of the adjacent Celtic fields. These earthworks, therefore, were in use during the Early Iron Age and perhaps also part of the Bronze Age.

What was their purpose? Theories based on conceptions that they were for defence, boundaries, or toll-bars, fail to account for all the facts. The existence of faint terrace-ways in some instances, however, suggest that they may have formed some sort of path leading across the exposed ridges from valley to valley. This theory does not run counter to any known facts, and is now generally regarded as the most probable solution of the problem. Sections cut through these 'covered ways,' as they are commonly called, reveal that, as originally dug, the ditches were deep and had narrow, flat bottoms,

wide enough for the tread of a horse or cow, while the banks must have originally stood from seven to fifteen feet above the bottoms of the ditches. If they were constructed for the purpose of cattle-ways, most of the difficulties will disappear, as they would serve admirably for the easy transference of cattle in single file between high banks from one valley pasture to another, while the multiplication of parallel ways—a feature difficult to explain on any other road hypothesis—would facilitate this proceeding. The high banks would not only prevent the beasts from straying, but might also present an obstacle to cattle raiders, and this suggestion is borne out by the existence of purely defensive ditches in conjunction with some covered ways.

For the sake of completeness it must be pointed out that, while the typical covered way possesses two banks, there are some earthworks undoubtedly constructed for the same purpose, which yet have only one bank. Notable examples exist on Rackham Hill, near Amberley, where a terrace-way continues the line of the ditch at both ends, and on Alfriston Down where there is a long terrace running from the south end. The last specimen is specially instructive, for it draws attention to the distinguishing feature of these one-bank covered ways, viz., that the bank is invariably on the lower side of the ditch, contrary to the usual habit of defensive earthworks. On Alfriston Down the gradient of the hill is such that in order to keep to the lower side of the ditch the single bank of the covered way has to cross over from one side to the other, the continuity of the ditch remaining unbroken.

There are other earthworks which resemble the 'covered ways,' but are larger and longer, and less restrained in the course they take. The latter shows that they must have served as roads and that defence was never their object. Sussex possesses three

examples of these ' wandering ditches,' each nearly a mile in length, namely, one on Steep Down (Lancing), the ' War Dyke ' in Arundel Park, and one on Rewell Hill, near Arundel (see Appendix to this chapter, D., 10 (*b*), 16 and 18 respectively).

The writer knows of only two roads which can claim to be as old as the neolithic period, being in each case a disused terrace or hollow-way interrupted by flint-mines. One is on Bow Hill (see p. 28), and the other near Tolmere Pond, Findon (p. 28).

We have now observed some of the principal characteristics of the different kinds of ancient roads in Sussex, and it remains to consider the problem of discovering how far it is possible to pick out prehistoric routes among roads in present use. It is proposed to illustrate this by examining a single example from which several lessons may be drawn.

The old village of Portslade, near Hove, stands a short distance behind the seaport town of the same name. This name, traced to its Saxon form, means ' Port's Road,' a fact which indicates that the village must lie upon a road that was already of some unusual importance in early Saxon times. Knowing as we do that the Saxons had no main roads but such as were bequeathed to them by their predecessors, we at once suspect the Roman or pre-Roman origin of Port's Road. In the village itself are the remains of an obviously old and almost disused hollow-way still known as the Drove Road. Such a name is in itself highly suggestive, because drove roads were long cross-country trails along which cattle used to be driven from one part of the country to another, and as generation after generation of drovers used the same trails, there is no saying to what antiquity they may go back.

This road traced south-westwards leads by Mile Oak Road to the site of the Roman villa at South-

wick. Traced north-eastwards, it is continued as a lane across the ridge of Fore Down, which bears a ridgeway, also in present use as a metalled road. Port's Road crosses Fore Down in just the sort of course that might have been taken by a 'covered way,' and the interesting thing is that at the point by Easthill Cottages where it crosses the Fore Down ridgeway it makes a slight double bend precisely comparable to that which is sometimes made by a covered way when crossing a ridgeway.

At this cross-road there once stood a Roman building—possibly a villa—as indicated by various remains found from time to time.*

The road continues north-eastwards in a direct line for Hangleton Manor Farm, an ancient manor-house which was constructed right across the line of the road, so that the latter is forced to make a detour round the house to regain its original line beyond it. This clearly shows that the road was there before the manor-house was built, and if the latter was built on the same site as its predecessors —for the manor is mentioned in Domesday—the probability is that the road is older than this Saxon settlement.

Leaving the manor-farm we pass the church and farm-buildings which are all that are left of old Hangleton. Crossing the Dyke railway the road ceases to be metalled, and now passes through the broken ground that marks the site of the medieval village of Hangleton, and then swings northwards to run parallel with the railway in the form of a magnificent grass-covered 'double-lynchet' road (Plate XXIV, 3). In this form it traverses the greater part of the length of the Brighton and Hove Golf-links as a ridgeway, terraced between ancient cultivations high up on the side of the ridge. Where it is possible to make out the form of the original

* *Sussex Notes and Queries*, I, p. 134.

fields, they are of a very early Celtic type, but appear to have been ploughed over more recently. To remove all doubt, however, the ancients were kind enough to place a barrow right on the crest of the lynchet that bordered the upper side of the road. This lynchet is five feet high, and consists of plough-soil—the gradual accumulation of centuries of ploughing of the top of the hill. It is right on top of this bank, when all this ploughing had ceased, that the Romanised Britons (as proved by excavation) built the barrow. This means that the road, which was at least as old as the first laying out of the fields, must be some centuries earlier than the Roman period.

The further course of the road northward is only marked by a green trail carrying a right of way and a parish boundary. Now most of the parishes had their boundaries fixed in or about the seventh century, and it is believed that in most cases they remain substantially the same at the present day. Roads were often used as landmarks, and it is obvious that when a road carries a parish boundary, the former must have been already in existence when the latter was fixed. Unless, therefore, any change has occurred in this boundary, the line of the road in question was probably in existence in or about the seventh century.

The boundary accompanies the greenway until it strikes the main road from Brighton to the Dyke ; it follows this road for a few yards and then strikes off again obliquely to the right to follow the nearly obliterated traces of an old road across Summer Down to the edge of the precipitous Dyke valley. The way in which the boundary, and by inference also Port's Road, crosses the Dyke Road shows that the latter is at least as old as the former, and as the Dyke Road is a typical ridgeway throughout the whole of its course from Brighton, there is

very little doubt that it represents a very primitive trail.

The parish boundary which has been our guide has brought us to the edge of the Dyke valley at a point exactly at the head of a typically engineered Roman terrace-way which descends the steep hill to the bottom of the valley between Saddlescombe and Poynings.

We may now summarise the evidence relating to the antiquity of the road as a whole. This may be considered under the heads of (1) proof; and (2) circumstantial evidence.

(1) Under the heading of proof we have the evidence of the barrow on the golf-links which shows that the road was in existence long before the Roman period, probably at the beginning of the Early Iron Age. We also have the characteristically engineered terrace-way in the Dyke valley to show that it was in use in the Roman period.

(2) In the light of these items of conclusive evidence, it is worth while considering the value of the half-dozen points of circumstantial evidence, none of which is individually conclusive, but which in the mass provide a strong argument in favour of the antiquity of the road as a thoroughfare. These points are: (*a*) the existence of two sites of Roman buildings on the line; (*b*) the name of Portslade; (*c*) the name of the Drove Road in Portslade; (*d*) the double bend at the crossing of the Fore Down ridge-way; (*e*) the position of Hangleton Manor Farm athwart the road; and (*f*) the association of parish boundaries along part of its course.

These points are all worth consideration as evidence in the tracing of other ancient roads. This is a subject which offers almost unlimited scope to the amateur, but too much stress cannot be laid on the necessity for definite and concrete evidence in favour of views put forward.

EXAMPLES AND BIBLIOGRAPHY

Explanations :

Bivallate : a road or ditch between two banks.
Univallate : a road or ditch accompanied by a bank on one side only.
N.B.—This list does not pretend to be exhaustive.

A. CELTIC FIELD-WAYS (for details see Appendix to Chapter V) :

Eastbourne District :

1. Fore Down, above Old Kiln Bottom : 6 in. O.S., 79, N.E. Double-lynchet type.

Lewes District :

2. Cliffe Hill (south slope) : 6 in. O.S., 54, S.W. and S.E. Double-lynchet type.

Brighton District :

3. Buckland Bank, Falmer : 6 in. O.S., 53, S.E. Bivallate road along ridge ; branch of double-lynchet type crosses valley to west. Plan in *S.A.C.*, LXIV, p. 36.
4. Eastwick Bottom (near Brighton) : 6 in. O.S., 53, S.W. Bivallate type.
5. Round Hill (on Brighton and Hove Golf-links) : 6 in. O.S., 52, S.E. and 65, N.E. ' Port's Road '—an exceptionally fine example of double-lynchet type (Plate XXIV, 3). See *Brighton and Hove Archæologist*, III, pp. 33-7.
6. Tenantry Hill, 1-2 miles S.W. of the Dyke : 6 in. O.S 52, S.W. and S.E. Bivallate type.
7. Truleigh Hill, on S.E. spur between Summersdean Farm and Bushy Bottom : 6 in. O.S., 52, S.W. Plan in *Brighton and Hove Archæologist*, II, pp. 54-6. Both bivallate and double-lynchet types.

Worthing District :

8. Park Brow, Sompting : 6 in. O.S., 51, S.E. Both bivallate and double-lynchet types. Plan in *S.A.C.*, LXIV, facing p. 30.

9. KITHURST HILL, near Storrington : 6 in. O.S., 50, N.E. Both bivallate and double-lynchet types. Plans in *S.A.C.*, LXIV, pp. 1, 20, 26.

Arundel District :

10. ARUNDEL PARK, on the brow N. of the W. end of the lake : 6 in. O.S., 50, S.W. Good double-lynchet road, and mutilated remains of (?) bivallate road.

Chichester District :

11. EAST DEAN WOOD : 6 in. O.S., 35, S.W. Bivallate type.
12. BOW HILL : see appendix to Chap. V, No. 18.

B. ENGLISH MANORIAL LANES :

Outstanding examples may be seen in most of the lanes connected with the following manors : Lancing, Sompting, Durrington, Ferring, E. Preston, Rustington, and very many other manors situated between the Downs and the sea. Also lanes and footpaths connecting the manors situated *immediately* under the escarpment of the Downs (viz., the ' Underhill Road '), e.g. Folkington, Wilmington, Alciston, Firle, Plumpton, Westmeston, Clayton, Newtimber, Poynings, Fulking, Perching, Edburton, Beeding, Bramber, Steyning, Wiston, Washington, Sullington, Parham, Amberley (*not* the modern Storrington-Houghton main road), Bury, Bignor, Glatting, Sutton, Barlavington, E. Lavington, Graffham, Cocking, Bepton, Didling, Treyford, Elsted, Harting. Also lanes connecting manors in the river valleys, e.g. (R. Cuckmere) Lullington, Litlington, Charlston, Winton, Alfriston ; (R. Ouse) Tarring Neville, S. Heighton, Kingston, Iford, Rodmell, Southease, Piddinghoe, Meeching ; (R. Adur) Annington, Coombes, Applesham ; (R. Arun) Houghton, N. and S. Stoke, Offham, Peppering, Burpham, Warningcamp.

C. TERRACE-WAYS OF ROMAN TYPE :

These are very numerous, only a few being selected below.

Eastbourne District :

1. Windover Hill, Wilmington : 6 in. O.S., 68, S.E. Two terrace-ways ascend the hill and meet above the head of the ' Long Man.' For description see Chap. VII (pp. 132-3).
2. Alfriston Hill : 6 in. O.S., 68, S.W. A terrace-road ascends the N. face of the hill westwards from Winton. Probably connected with the univallate ' covered way,' *q.v.* below, D., No. 3.
3. Firle Beacon, the ' Rabbit Walk ' : 6 in. O.S., 67, N.E. For description see above, pp. 108-9. For more details see *Arch. Journ.*, LXXII, pp. 207 ff. (A. Hadrian Allcroft).

Lewes District :

4. Kingston Hill : 6 in. O.S., 66, N.E. Described by Mr. A. Hadrian Allcroft in *Arch. Journ.*, LXXII, pp. 221 ff.

Brighton District :

5. Dyke Valley : 6 in. O.S., 52, S.E. This terrace-way, descending the S. side of the valley, carries ' Port's Road ' and also the ridge-way that runs north from Hangleton Manor Farm past the Dyke Hovel and the Dyke Railway Station. Described by Mr. Allcroft in *Arch. Journ.*, LXXII, pp. 215 ff.
6. Truleigh Hill, above Truleigh Farm : 6 in. O.S., 52, S.W. Two terrace-ways, one of which probably continues the ridge-way of Thundersbarrow Hill.

Worthing District :

7. Steyning Round Hill : 6 in. O.S., 51, S.E. A terrace-way descends the W. flank of the spur, and forks halfway down. (*a*) The left branch is continued as a footpath across a field, and enters Steyning, where its line is continued by Church St. Two miles further N.E. in the same general line is *Streat*ham Farm, by the R. Adur, a name which, if ancient, is a fairly sure sign of the presence of a Roman road. (*b*) The right branch swings eastwards round the nose of the hill (accompanied by old hollow-ways which must be older than the terrace) and was continued towards Heathen Burials Corner, between Bramber and Steyning (Plate XXIV, 2).

8. Steyning Flagstaff Hill : 6 in. O.S., 51, S.E. Two good terrace-ways, one on each flank of the spur.
9. Chanctonbury : 6 in. O.S., 51, N.W. Two good terrace-ways, one immediately below (N. of) the Camp, and the other $\frac{1}{4}$ mile to the W. These may have been constructed as approaches to the Roman temple within the ring.
10. Chantry Hill, near Storrington : 6 in. O.S., 50, N.E. From Chantry Post a terrace-way descends to N.W., towards Greyfriars. The borstal descending from the same starting point towards Chantry House was probably originally a terrace-way also, but has become a hollow-way through use by wheel-traffic.
11. Amberley Mount : 6 in. O.S., 50, N.W. A small but very perfect example.

Far West Sussex :

12. Bignor Hill : 6 in. O.S., 49, N.E. The terrace-way of Stane Street, already described (pp. 103-4). Much mutilated by wheel-traffic during the last fifteen years.
13. Harting Down : 6 in. O.S., 33, N.E. 'The Miller's Walk,' described on p. 109.

D. 'COVERED WAYS,' all bivallate unless otherwise stated :

Eastbourne District :

1. Willingdon Hill : 6 in. O.S., 79, N.E. From the Weald to Harewick Bottom, probably contemporary with lynchets, but earlier than valley entrenchment. See *S.A.C.*, LIX, pp. 35-6. *Trans. Eastbourne Nat. Hist. Soc.*, January, 1917, pp. 45-53 (H. S. Toms).
2. Fore Down, Litlington, W. of Winchester's Pond : 6 in. O.S., 79, N.E. From Deep Dene to Old Kiln Bottom.
3. Alfriston Down : 6 in. O.S., 68, S.W. Univallate ; starts from Roman terrace-way on N. escarpment, and runs S. to France Bottom. Bank keeps to lower side of ditch, and so has to change from E. to W. side as gradient of hill changes. Continued southwards by terrace-way 900 yards long in France Bottom. See *S.A.C.*, LXIII, pp. 39, 40.

Lewes District :

4. Swanborough Hill, above Kingston, near Lewes : 6 in. O.S., 66, N.E. and 67, N.W. From Long Bottom to Balsdean Bottom.
5. Black Cap Hill, Plumpton : 6 in. O.S., 53, N.E. W. of the clump ; extends from coombe behind Novington Farm to plantation behind racing stables. *S.A.C.*, LIX, p. 36.

Brighton District :

6. Wolstonbury Hill : 6 in. O.S., 52, N.E. Across neck of approach to the Camp, from Welcombe Bottom to the S.W. towards Pyecombe.
7. Newtimber Hill : 6 in. O.S., 52, N.E. From the Weald to Saddlescombe valley. Much mutilated. Section cut ; see *S.A.C.*, LIX, pp. 37-8, 55-7.
8. Summer Down, S. of the Dyke valley : 6 in. O.S., 52, S.E. Two specimens ; (*a*) from the Dyke valley to Ewe Bottom ; mutilated ; *S.A.C.*, LIX, p. 38. (*b*) From the Dyke valley to valley by Dyke Railway Station ; almost obliterated.

Worthing District :

9. Hill Barn, Steyning : 6 in. O.S., 51, S.E. From Soper's Bottom to head of Lychpole Bottom. Traces have been observed that it originally continued across Lychpole Bottom and the upper part of Park Brow to Stump Bottom.
10. Steep Down, Lancing : 6 in. O.S., 64, N.E. Two specimens : (*a*) on N. side of the hill, partly univallate and partly bivallate ; running from Winding Bottom to Lychpole Bottom. Its bent course is difficult to understand unless the two arms represent two divergent branches of a road, now lost, which came over the top of the hill. (*b*) On the S. side of the hill a large specimen crosses the S.W. spur from near Titch Hill Farm, then crosses a little valley and so on to the S.E. spur, along the back of which it runs as a ridge-way towards Lancing Clump. Before reaching this, however, it turns abruptly to the left and ends on the brow overlooking Cow Bottom. From the end of the earthwork a rough terrace continues along the side of Cow Bottom east-

wards towards the R. Adur. This specimen seems intermediate in character between a covered way and a field-way. These two earthworks have been incorrectly considered to be part of a plan of fortification of Steep Down.

11. Chanctonbury: 6 in. O.S., 51, N.W. A sickle-shaped example 400 yards S.E. of the Ring. There is a gap in the curved portion, not original. Extends from the Weald to Well Bottom. For other details see appendix to Chap. IV, No. 15. See also *S.A.C.*, LIX, pp. 53-5; the hesitancy to accept this specimen as a covered way has now been removed. See plate XXV.

12. Highden Hill, Washington: 6 in. O.S., 51, N.W. A good specimen running from the Weald to Highden Bottom into which it descends by means of a terrace-way between contemporary fields of Celtic type. A small barrow stands in contact with the W. bank on the top of the hill. See *S.A.C.*, LIX, pp. 38-9; LXIV, p. 56.

Arundel District:

13. Rackham Hill: 6 in. O.S., 50, N.W. and N.E. Two specimens: (*a*) a large and conspicuous univallate earthwork, called Rackham Bank, crosses the ridge from the Weald to Medley Bottom. Terrace-ways descend from both ends of the ditch, proving it to have been used as a road. From the N. end two terraces descend to the Weald, one on each side of the small coombe, that on the east still carrying a bridle-track, while that on the west is very indistinct, but visible to the practised eye. From the S. end a terrace-way runs along the side of Medley Bottom for 300 yards. (*b*) A bivallate specimen almost obliterated by ploughing connects the head of Medley Bottom with the Weald a little distance W. of (*a*). Three terrace-ways branch from the N. end and descend to the Weald, a habitation platform (?) being situated close to one of them. See *S.A.C.*, LXIII, pp. 45-50 (with plan).

14. Barpham Hill: 6 in. O.S., 50, S.E. An exceptionally large specimen connecting Lowsdean with the valley in which lies Lower Barpham Farm. The S. bank still stands 10 feet above the ditch, and the N. bank 8 feet. See *S.A.C.*, LXIII, pp. 20-1.

15. Camp Hill, North Stoke : 6 in. O.S., 50, N.W. and S.W. ; 700 feet E. of Canada Cottages between Stoke Bottom and the valley to the S. See *S.A.C.*, LXIII, pp. 52-3.
16. Arundel Park and Rewell Hill : 6 in. O.S., 50, S.W. The ' War Dyke ' (popularly but erroneously connected with the siege of Arundel Castle in the Civil Wars) is the largest and almost the longest covered way in the county, being nearly a mile in length. Its west end is in Whiteways Plantation (part of Rewell Wood), where it ends on the brow of the hill with an abrupt turn very similar to the Steep Down example (No. 10*b*). In this part it is bivallate and of large dimensions, which can be seen on the side of the cutting where the Arundel-London road cuts through it. In the Park it descends the side of a spur through South Wood to the R. Arun, and in this part is univallate, owing to its situation. In Whiteways Plantation it is accompanied by two other parallel and smaller covered ways. Mr. Allcroft considers it to be part of a long cross-country route, probably to be linked up with the Barpham and Steep Down examples. See *S.A.C.*, LIX, pp. 39-41, with plan ; LXIII, pp. 54-85, with plan.
17 Bury Hill, near Arundel : 6 in. O.S., 50, N.W. and S.W. Two examples : (*a*) one 500 yards N. of the War Dyke, running between the Arun valley and Houghton Forest. This specimen has a double-bend at the point where it is crossed by the Bury Hill ridgeway. (*b*) The other example, 900 yards N. of the last described, runs parallel with it, but has been almost entirely obliterated by ploughing during the last ten years. See *S.A.C.*, LIX, pp. 41-2.
18. Rewell Hill, near Slindon : 6 in. O.S., 49, S.E. This large and long specimen may not, perhaps, be correctly classed as a covered way, but it is undoubtedly a prehistoric road comparable to the War Dyke and the Steep Down specimen. It is over a mile in length and starts from the bottom of Fairmile Bottom, near Dale Park, ascends the west end of Rewell Hill obliquely like an embanked hollow-way, then turning it runs almost due S. for nearly a mile, mostly bivallate, the E. bank being the larger. On its way it is connected with a group

of rectangular earthworks which will be described elsewhere (pp. 137-9). See *S.A.C.*, LXI, pp. 26-7, with plans.

19. Glatting Down, near Bignor : 6 in. O.S., 49, N.E. An interesting specimen possessing a double bend and a faint terrace-way descending from the N. end to the Weald. It is completely breached by the triple roadway of Stane Street (Plate XXVI). See *S.A.C.*, LIX, pp. 42-4, 57-8, with plan and section as dug.
20. Burton Down, near Bignor : 6 in. O.S., 49, N.E. Close to the foregoing. Univallate ; crosses the spur from the Weald to Scotcher's Bottom. Evidently a road, from its course.
21. Sutton Down : 6 in. O.S., 49 N.E. Univallate ; carries on the line of the same route as the foregoing from Scotcher's Bottom to Westwood Bottom. Both these specimens have the same section and the same curious little accessory banks on the downhill side.
22. Upwaltham Hill : 6 in. O.S., 49, N.W. and N.E. Two parallel bivallate examples connecting Westwood Bottom with the head of a small valley that runs out to the coastal plain near Nore Hill. These specimens together with those on Burton and Sutton Downs seem to form one continuous route from the Weald to the coastal plain. There is a small covering earthwork on the S. and the western covered way has a double bend where it is breached by the ridgeway that leads to the Trundle Camp at Goodwood. See *S.A.C.*, LIX, pp. 44-5, 58-60, with plan and sections as dug.

Midhurst District:

23. Heyshott Down : 6 in. O.S., 34, S.E. and 35, S.W. Two distinct groups : (*a*) The eastern group consists of four parallel bivallate covered ways, three close together and one by itself, and also three univallate ditches. There are also eight barrows, of which four are ' rings,' three ' bowls ' and one ' bell ' (see Chap. III). (*b*) The western group has three parallel bivallate and two univallate members. See *S.A.C.*, LIX, pp. 46-9, with plans.
24. Linch Down : 6 in. O.S., 34, N.W. See *S.A.C.*, LIX, p. 49.

Chichester District:

25. Bow Hill : 6 in. O.S., 48, N.W. Two specimens : (*a*) Just S. of the rectangular Camp ; it connects the valley by Crowshall Farm with Stoughton Bottom. See *S.A.C.*, LIX, p. 49. (*b*) A long, poorly defined specimen runs towards N.W. from the same valley just N. of the Camp to the head of the valley N. of Stoughton Down. Various univallate earthworks on this hill will be described elsewhere (Chap. VII).
26. Stoughton Down : 6 in. O.S., 48, N.W.
27. Harting Down : 6 in. O.S., 33, N.E. A series of two bivallate and two univallate works connecting the Weald with Whitcombe Bottom. Two rude terraceways descend steeply to the Weald from the bivallate works. One of the univallate works is entirely breached by a barrow, and all the earthworks are breached by the Roman road coming up from the ' Miller's Walk ' (Plate XXVII). See *S.A.C.*, LIX, pp. 50-3, with plan.
28. West Harting Down : 6 in. O.S., 33, N.E. W. bank poorly marked. Connects the Weald with a valley which leads S. towards Ladyholt Park.

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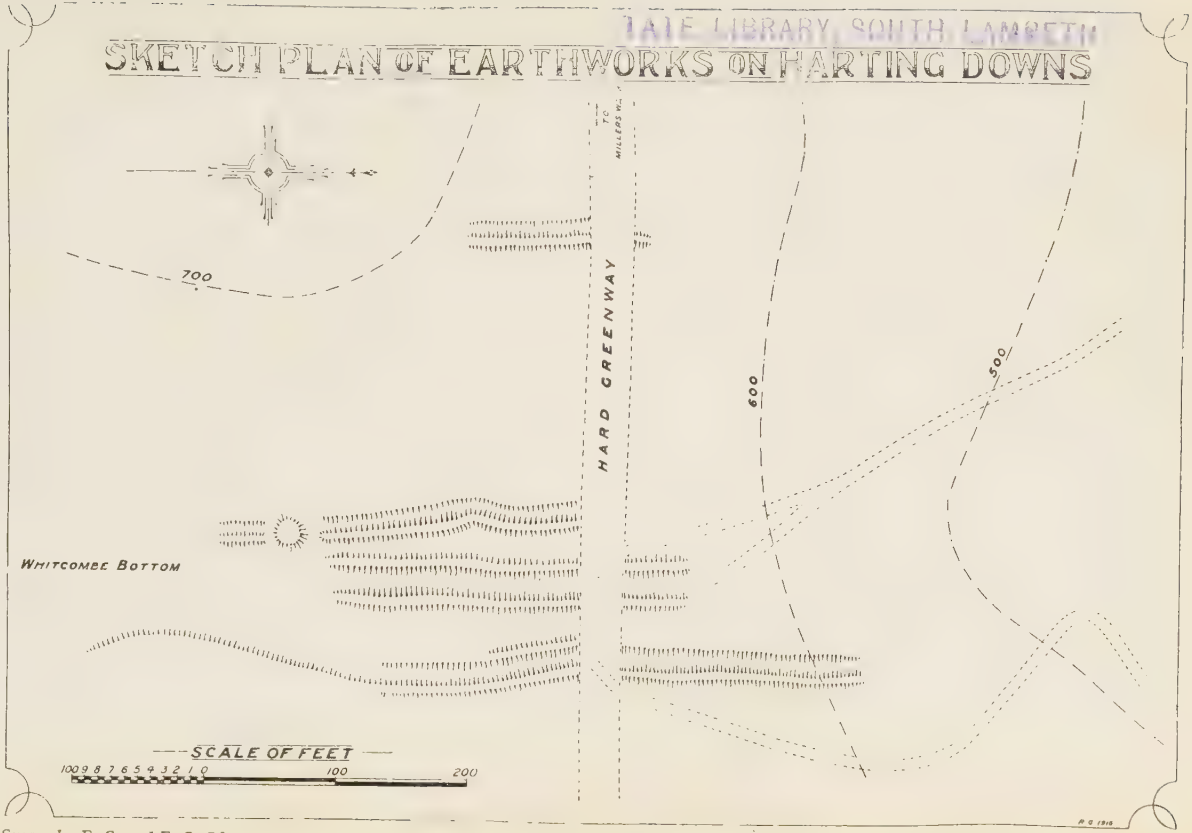

Survey by E. C. and E. C. C.]

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PLATE XXVII

GROUP OF 'COVERED WAYS' ON HARTING DOWN, BREACHED BY A ROMAN ROAD

9. Roman Roads on the S. Downs, *Arch. Journ.*, LXXII, pp. 201-232 (A. Hadrian Allcroft).
10. Covered Ways, *S.A.C.*, LIX, pp. 35-75 (Curwen), *Antiquity*, I, pp. 54-65 (R. C. C. Clay).
11. 'Port's Road,' *Brighton and Hove Archæologist*, III, pp. 28-41.

Chapter VII

MISCELLANEOUS EARTHWORKS

'Do you see nothing else remarkable?—nothing on the surface of the ground?'

'Why, yes; I do see something like a ditch, indistinctly marked.'

'Indistinctly!—pardon me, sir, but the indistinctness must be in your powers of vision.'

—Scott, *The Antiquary*.

The hills and valleys of the Sussex Downs teem with ancient remains. Every break in their sinuous outline, however small, is the work of man, whether ancient or modern, and has a tale to tell if only we have eyes to read it aright. Some of these tales have been unfolded in the preceding chapters—tales of the old people with their mining and farming, their roads and cities, and the memorials of their dead—but there remain certain other vestiges of their activities which come under none of these heads, and which now claim our attention. At the same time it will be convenient for those who are anxious to see for themselves some of these ancient remains if we consider one or two sites where various earthworks, of types already described, are grouped together amid some of the most beautiful scenery of the Downs.*

* It is necessary to emphasise the fact that intending students of earthworks should make sure that they are not trespassing in search of their quarry, especially in the case of those earthworks situated in woodlands. When in doubt, permission should be asked.

Ordnance Survey Air Photo] [*Reproduced by permission of the Controller of H.M. Stationery Office*

PLATE XXVIII

WINDOVER HILL FROM THE AIR, AT 5,500 FT.

In the centre are the Flint Mines crossed by two ancient roads. The ' Long Man ' is hidden in the shadow to the left of these.

Windover Hill (Plate XXVIII)

Windover Hill, locally pronounced 'Wyndore,' is a pretty name and one that is fully in keeping with the wind-swept beauty of the bare, undulating Downs of East Sussex. This hill is the lower western portion of the bluff mass of Wilmington Hill, and lies but five miles to the north-west of Eastbourne.* On its highest point stands a conspicuous " round barrow " —a big mound of earth surrounded by a ditch, an excellent example of its kind—marking the burial place of some early Bronze Age chieftain of about the time of the Judges of Israel. A few yards down the hill towards the west is a " long barrow " where lies a nameless hero of the later Stone Age who flourished and performed his feats of valour in or before Abraham's day. One cannot but admire these two worthies in their choice of the sites of their final resting-places, for truly the view from this point is one of the grandest in East Sussex. To the north lies the great expanse of the " dim blue goodness of the Weald," stretching away to Surrey. Westwards across the Vale of Cuckmere the chalk hills rise slowly to the summit of Firle Beacon, where sleeps another Stone Age chieftain, and away beyond stands Mount Caburn, towering above the valley of Glynde, with the sunlight breaking through upon its crowned head.† To south and south-west lie bare, rolling hills and wild valleys, once corn-lands, but now verdant pastures where shepherds lead their flocks and water them in the dew-ponds on the hills. There, too, are the silver windings of the river Cuckmere, and beyond all the blue mantle of the sea.

Another Stone Age hero lies buried but half a mile

* 6 in. O.S., 68, S.E. and 79, N.E.

† The ramparts of the Celtic city that stood on Mt. Caburn, encircling the dome-shaped summit of the hill, give it something of the appearance of a crowned head when seen from a distance.

distant on the north-east shoulder of Wilmington Hill in a long barrow known by the romantic name of the Hunter's Burgh, or hunter's barrow (Plate VII). Folk-memory and tradition may be sadly misleading, but sometimes they are strangely tenacious of facts. Whether the unknown hero who sleeps here was a hunter we may never know, but certain it is that he lies buried in a position from which his spirit, if it returned, could see nothing of the sea or the Downs, but only the great forest of the Weald wherein roamed deer and wolves and boars innumerable.

On the saddle between these two hills is a small round barrow of the "platform" type, in which there probably lie the remains of another Bronze Age notable. This barrow marks the point at which two pathways, ascending the hill from north-east and north-west, emerge on the summit. Both these tracks are green terrace-ways, that on the east being a beautiful specimen, typically Roman, and unconnected with other roads at present in use. The western path, locally known as the Giant's Causeway, is also a terrace, but of less even gradient. It ascends the hill from Milton Street on the west, and at first it has the form of a disused hollow-way bordered on the south side by lynchets, or cultivation banks, of Celtic type. This shows that the road existed in Celtic or Roman times, but it has been much worn by the passage of coaches to Eastbourne in the eighteenth century. Ascending past the head of Ewe Dene, a deep valley on the right, we find that the road divides into three branches : (1) the right branch is the modern coach-road which circumvents the south side of the hill ; (2) the left branch is the Giant's Causeway, which assumes a grassy terrace form and carries a parish boundary, both of which are signs of antiquity, and this is the part already referred to as reaching the top of the hill near the platform

barrow ; (3) the middle branch takes the form of a beautifully cambered, turf-covered road between ditches, a form very suggestive of Roman construction.* This branch also circumvents the south side of the hill, passing close to the long barrow and large round barrow to rejoin the two terrace-ways near the platform-barrow. It therefore looks like an attempt on the part of the Romans to improve on the narrow and precipitous Giant's Causeway.

If we return to the platform-barrow in the col between Windover and Wilmington Hills and examine the upper ends of the two terrace-ways which we have just been describing, we shall see that in the last few yards of their course both paths thread their way over and between some irregular grassy humps and hollows, and careful examination will show that the gradient of the eastern terrace has been planned so as to bring it on to the top of one of these humps, and that the terrace could not have existed before the hump was thrown up. These irregular pits and mounds must therefore be older than the Roman terrace-way, and in fact they exactly resemble in appearance the well-known flint-mines of Cissbury, Harrow Hill and elsewhere. There is, therefore, very little doubt that these irregularities of the ground represent the filled-in mouths of shafts where flint was mined, similar to those described in an earlier chapter, and that the humps and mounds are the heaps of refuse material thrown out from the shafts in the working of the mines. These pits can also be traced westwards along the brow of the hill above the Giant's Causeway, but they must be carefully distinguished from the more modern chalk quarry situated on the top of the hill close to the large round barrow.

It has already been hinted that the rolling slopes and valleys to the south of Windover Hill have not

* Described by Mr. H. S. Toms in *S.A.C.*, LXIII, pp. 161-3.

always been the wild pasture lands that they are to-day. The whole of the south-west spur of the hill, and of the valley on the south-east called Deep Dene, is covered with lynchets or cultivation baulks typical of the agriculture of the Celtic period (Plate XXIII). The individual lynchets are not high or conspicuous, and as their steep slopes face south they can most readily be viewed from that quarter, viz., from Fore Down, being scarcely visible from Windover Hill itself. The series is a very extensive and complete example of the fields belonging to a Celtic village, but the site of the village itself has not yet been discovered.

One of the most intriguing mysteries of this interesting hill centres round the " Long Man of Wilmington," or the " Wilmington Giant," as he is called, the outline figure of a man, 226 feet high, carrying a long staff or spear in each hand (Plate XXIX). This figure, which is cut in the turf on the steep north face of the hill, is probably the largest representation of a man to be found anywhere in the world, so far as our information goes, there being only one other like it, viz., the giant of Cerne Abbas in Dorsetshire, whose height is 180 feet. This rival figure differs principally in possessing a more detailed anatomy and in brandishing a ferocious club instead of two staves or spears.

Of theories as to the origin of the Wilmington Giant there have been legion, all of them suffering, unfortunately, from lack of sufficient evidence to support them. Of facts as to his history we have none. The earliest reference to his existence comes from the Burrell MSS. of the eighteenth century, and the outline of the figure was perpetuated by means of white bricks in 1874. But as to who first carved the figure, or when, or why, no man knows.

Let us look at some of the principal theories that have been put forward. The Giant was regarded as

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[*By kind permission of the Editor of the Sussex County Magazine*

PLATE XXIX

THE 'LONG MAN' OF WILMINGTON.

serving the purpose of an almanac, it being suggested that the shadow of the hill touched the tips of the spears at the equinoxes. But careful experiments and investigation by Sir Flinders Petrie have shown that this theory will not hold, for the shadow of the hill does not behave in accordance with expectations.

Others have suggested that the " Long Man " may represent such Anglo-Saxon heroes and deities as Beowulf, Woden and Baldur, and much interesting mythological data, as well as some analogous figures with two spears, have been put forward to substantiate these views.

A local tradition used to say that once upon a time there lived two giants, one on Windover Hill and one on Firle Beacon. They quarrelled, and the Firle Giant threw boulders at his fellow, the dimpled marks of the flint-mines being regarded as the craters resulting from this bombardment. At last one boulder laid low the Windover Giant, and there he lies on the hill to this day. Where? Does the tradition refer simply to the figure or to the long barrow on the top of the hill above the figure? Long barrows are sometimes called Giant's Graves, and there is another long barrow on Firle Beacon, as well as others in the neighbourhood. Does this tradition imply that the figure of the Long Man is a representation of the neolithic chief who was buried in the long barrow above? It is at least a possible theory, but, like the others, lacks sufficient evidence for its support.

Now there is no mystery regarding the purpose of the Cerne Abbas Giant in Dorsetshire, whatever his date may be. He was connected with the primeval cult of fertility—a gross form of paganism which we know to have formed part, at least, of the religion of the neolithic period, and which persisted in parts of Europe down to the eighteenth century. In

England it was made impossible only by the moral uplift that accompanied the Reformation, and though certain practices that were connected with the cult, such as the maypole festivities, survived till more recently, yet their origin, meaning and unpleasant associations were forgotten.

There is some reason to believe that the Wilmington Giant may have been constructed for the same purpose, and the proximity of both these figures to religious houses—Cerne Abbey and Wilmington Priory—has raised the question as to whether the monks may not have been responsible for them. Such an idea has been held by some to be inconceivable, but seeing that so much of what was called Christianity in the middle ages was but a thinly disguised paganism lacking most of the essentials of the Christianity of the New Testament, there was room for the growth of many pagan practices. Further, there is actual documentary evidence that some such figure of the god of fertility was, at any rate on one occasion in 1268, made by monks for the benefit of the common people on the occasion of an outbreak of disease among their cattle.*

The most probable solution, therefore, of the mystery of the Long Man is that he was an idol, made at any period between the neolithic and the middle ages, and propitiated by offerings and degrading observances by which men hoped to increase the fertility of their fields, their flocks, and of themselves.

Rewell Hill, Arundel

The Downs which lie west of the river Arun have a charm altogether different from that of the hills we have been considering in East Sussex. Instead of

* *Chronicle of Lanercost*, anno 1268 ; cited by J. G. Frazer, *Balder the Beautiful*, I, p. 286, and by H. S. Toms in a letter to the *Herald Magazine*, May 9th, 1925. There appears to be some evidence that gross fertility customs were allowed, even if not actually patronised, by the medieval church in France and Italy.

bare, windswept heights are hills thickly clad with beech and yew, hazel, thorn and juniper. The woods of Arundel are a paradise without equal in Sussex, where, even in the Park, you may roam for days on end and never see a fellow man, but only the shy red deer flitting through sunlit glades. There are no colours on earth so soft and alluring as those of the beech-woods, and of Arundel in particular. Stand in Houghton Forest on a frosty afternoon in winter and watch the sun go down through the trees in a golden sky, and all around the leafless woods are a subtle mauve that defies the brush. In spring they are purple with the bursting of the buds, in summer the most heavenly green, but if you would see them at their best go in autumn. The little lake winds between hills clad with beeches, a glory of green and gold in the hazy morning sunlight ; beneath them the sun glints upon a red carpet of leaves, while the waters reflect the blue of the sky. Go again at dusk when the moon is rising, when not a breath stirs the leaves, and a timid stag steals down to the lake to drink, and the air is full of the scent of decaying leaves, like fresh walnuts. There is no sound but the lowing of a deer, the cry of a peacock, or the splashing of a startled wild-duck. Surely a paradise is not too strong a word to use of the woods of Arundel !

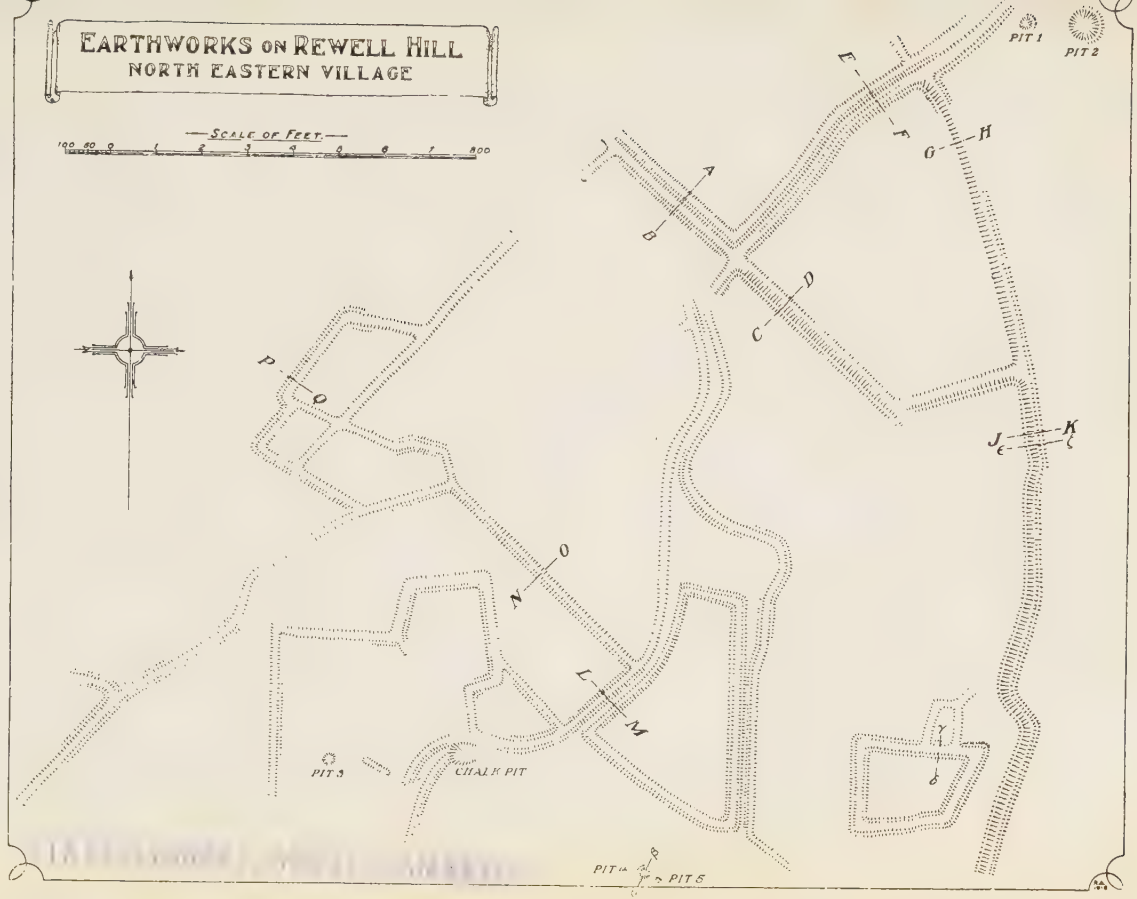
Rewell Hill stretches west from Arundel Park, and rises steeply on the south side of Fairmile Bottom. Its gentle southern slopes are thickly clad with hazel and young Spanish chestnuts intersected with a network of paths to facilitate shooting. These woods, which are of considerable area, conceal some of the most extensive and mysterious earthworks in the county, so effectively screened by the trees that they seem to have escaped notice until a very few years ago. Indeed it is very problematical whether it would be possible for the reader to locate them unless per-

sonally conducted by one who is familiar with the ground.*

The earthworks lie in three groups, the largest of which (the north-eastern site) is situated in Dalesdown Wood, and is approached from opposite the Duchess' Lodge of Arundel Park (Plate XXX). It consists of a little over three miles of banks and ditches interlacing and branching in all directions, and covering an area of about 80 acres. Some are mere ditches, faintly marked and without banks ; other ditches have one or two banks ; at other places two ditches with two, three, or four banks run parallel to one another. Some of these earthworks wander about in an inconsequent manner, others enclose irregular quadrilateral plots. The whole thing is extremely puzzling, the more so as some tentative excavation in 1919 failed to throw much light on the matter. The sole relics were three shards of Early Iron Age pottery which were found on the floor of one of the ditches, and only one piece of pottery—a piece of a Roman amphora—has ever, to the writer's knowledge, been found on the surface.

The remaining two sites, one near the western end of the hill, and the other on the south in Gobblestubbs Copse (near the Chichester road, two miles from Arundel) resemble one another in consisting of parallel ditches and banks approaching and surrounding a series of contiguous rectangular enclosures. They evidently belong to the same general type as those in Dalesdown Wood, but are less extensive. The western site is connected with a long wandering prehistoric road, accompanied by massive banks, which ascends the hill obliquely from Fairmile Bottom at a point opposite the wall of Dale Park, and turns southwards for a total distance of over a mile (see p. 126).

* Rewell Wood is private property, though not entirely fenced off, and the intending visitor should first seek permission from the Estate Office.



Survey by E. C. and E. C. C.]

PLATE XXX

[Reproduced from Sussex Arch. Coll. LXI.

Such little evidence as is forthcoming seems to show that these mysterious earthworks should be classed as prehistoric rather than medieval. But what their purpose can have been can only be guessed at. The only suggestion that has yet been made is that they formed settlements or villages of some sort, but if so, one would have expected to find more in the way of surface finds. At present we must be content to class them as unsolved problems.

Not dissimilar are the curious banks and ditches at Bexley Bushes on the golf-links at Goodwood, but these are just as great a problem as those of the Rewell. As things stand there is absolutely no evidence to go by, so that speculation is worthless. This may enhance their charm—for the unknown is more alluring as well as more awesome than that which is familiar—but it does not help in the reconstruction of history.

Bow Hill (Plate XXXI)

The further west we go on the Sussex Downs, the wilder becomes the character of the country and the more remote from civilisation it appears to be. Fortunately this country is far from the big towns, the roads are comparatively few and poor, and trippers rarely stray far from their conveyances, so that the western Downs still preserve their character of a beautiful and entrancing wilderness. Of such scenery Bow Hill, five miles north-west of Chichester, affords one of the best examples. It is a conspicuous ridge, in plan like an inverted Y, between the two short arms of which lies the lonely Kingley Vale, where according to popular tradition a great battle was once fought with the Danes. Visited in any season and in any weather this weird valley is a fit place for the growth of legends and would impress the most unromantic mind. The semi-circular sweep formed by the arms of Bow Hill enclosing the valley

on the north is densely clothed with yew-trees whose sombre foliage is here and there relieved by the lighter green of a beech or the silver leaves of a white beam. In the centre of the greensward which carpets the floor of the valley stands a grove of ancient and gigantic yews, tall and stately as if they had been created by the brush of some Old Master. Seen at midday this valley is awesome, but by the light of the setting sun it is enchanted ground, haunted by the spirits of the vanished peoples of long ago.

Bow Hill itself is thinly covered with a scrub of thorn and yew and juniper—a trio which recalls Kipling's magical Oak and Ash and Thorn, and their association with the People of the Hills and the Old Things. It was in rain and mist that the writer first explored the hill as a boy, and the impressions received have never been forgotten—the wildness and the weirdness of it—the mounds and banks of the Old People looming out of the swirling mist—the bits of their pottery in the mole-hills—and the general sense of being in an unreal world peopled by kelpies, pixies and goblins.

But to come down to realities—Bow Hill and its outlying spurs possess a most interesting collection of earthworks. The highest part of the hill seems to have been partially enclosed by banks and ditches thrown across the three limbs of the Y and along the crest of the steep north-west slope. The curious thing is that in each case the ditch is on the upper side of the bank, and this, together with the fact that the enclosure is very far from complete, suggests that its purpose, whatever it may have been, was not military or defensive. The area of the top of the hill, thus delimited, contains four large " bell " barrows of the early Bronze Age (Plate VIII), a " covered way," and a large disused water-pit fed by three runnels dug at a considerable expenditure of labour. Whether or not any of these objects were contem-

porary with the enclosing earthworks cannot be ascertained except possibly by the spade, but there is perhaps some significance in the similar features exhibited by the earthworks on Butser Hill, eight or nine miles away across the Hampshire border. There we find the same curious ramparts, with ditches on their upper sides, thrown across some of the spurs of the hill, while on the summit are large barrows and a water-hole, and just outside the area are two "covered ways." These correspondences may be fortuitous, but, if so, the coincidence is a strange one. Until the relative dates of these earthworks are determined it is useless to guess whether their purpose was religious or otherwise.

If we return to Bow Hill and examine the rampart which bounds the north side of the top of the hill we shall find that its eastern portion forms the south wall of a small, roughly rectangular enclosure, called Bow Hill Camp.* It has a single entrance in the middle of its east side, opening on to the ridgeway of the hill, thus demonstrating the antiquity of this road. The plan of the Camp is too bad a rectangle to be Roman ; it is more likely to be older, and we know that in the late Bronze Age rectangular Camps were constructed in Dorsetshire, while the habit of the Early Iron Age was to make them either circular or of such a shape as would cover the whole top of the hill. This camp does, however, bear a strong resemblance to certain rectangular enclosures found in some parts of Germany and attributed to the last century B.C.† Only the spade can decide this matter, and in the meanwhile we must be content to leave it so, a thing mysterious, a monument of unknown antiquity, a relic of those elusive People of the Hills, who, when they went the way of all mortals, became the brownies, the elves and the hobgoblins of our childhood.

* See appendix to Chap. IV, No. 21.
† See *Antiquity*, II, pp. 50-5.

Immediately to the north of this Camp a poorly marked " covered way " leads from the steep combe on the east across to the head of the little valley which separates Stoughton Down from the northern tail of Bow Hill. On Stoughton Down itself are two small long barrows and yet another covered way. On the northern tail of Bow Hill, close to the lonely Holmbush Cottage, are the curious concentric rings of Goosehill Camp situated on a seemingly impossible slope. No explanation of this remarkable earthwork is yet forthcoming, but Mr. Allcroft's suggestion that it may be mediæval is well worth consideration.

Let us now retrace our steps southwards along the ridge toward Bow Hill Camp, and after traversing two-thirds of the distance descend the hill to our left by an oblique terrace-way which is not easy to find among the scrub of juniper, thorn and bramble. This grassy terrace-way is typical of Romano-British construction, as described in an earlier chapter. Reaching the bottom of the hill it swings eastwards among the lynchets of contemporary Celtic fields and takes the form of a grass-grown hollow-way, showing traces of ditches on either side. Excavation has shown that these ditches continue further down the hill than they appear to do on the surface and that they were probably added to the road in Roman times. The site of the village inhabited by those who tilled the fields has not yet been located, but it is probable that the saucer-shaped hollow adjoining the north side of the road formed their " Circus," or communal meeting-place. At any rate the spade has shown that it dates from Roman times and that it never was intended to be a pond. The mound, too, on its east edge would appear to have been older still.*

But the interest of this remarkable hill is not yet exhausted. There are flint-mines on the brow overlooking Kingley Vale, erroneously marked as a

* See appendix to Chap. V, No. 18.

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PLATE XXXI

BOW HILL : AN OBLIQUE AERIAL VIEW FROM THE S.W.

On the right is Kingley Vale with its yew-trees ; on the hillslopes in the foreground are the traces of rectangular prehistoric fields ; on the bare top of the hill the large bell-barrows (Plate VIII) can just be seen.

"British village" by the Ordnance Surveyors. The dimpled hollows which mark the filled-in shafts have completely cut through a pre-existing road which wound round the nose of the hill. This is a great rarity—an authentic neolithic road. On Stoke Down, the south-east limb of Bow Hill, there are more flint-mines north of the clump of trees. Some of them were opened by Major Wade a few years ago, the most interesting find being the top-stone of a saddle-quern, indicating that the miners were familiar with corn, and affording the first evidence of neolithic agriculture in Sussex. A small rampart and ditch crossing the hill near the mines is encroached upon by a barrow which has in more recent times been used as a point of vantage for a three-legged wooden windmill. Such mills generally stood on a cruciform wooden base, and wherever a trench of that shape is found situated on a mound or within a circular groove, it must be interpreted as the site of a medieval or fairly modern windmill.

. . . . .

The above examples will illustrate a small fraction of the wealth of prehistoric remains in Sussex. Other details, of technical rather than general interest, will be relegated to the appendix.

MISCELLANEOUS EARTHWORKS AND BIBLIOGRAPHY

A. *Sites described in the text :*

1. Windover Hill, Wilmington : 6 in. O.S., 68, S.E. See *S.A.C.*, LXIX (1928), pp. 92-101. For the 'Long Man,' see Flinders Petrie, *Hill Figures of England* (1926).
2. Rewell Hill, Arundel : 6 in. O.S., 49, S.E. See *S.A.C.*, LXI, pp. 20-39 ; Gobblestubbs Copse, 6 in. O.S., 62, N.E. See *S.A.C.*, LXIX (1928), pp. 222-3.
3. Bow Hill : 6 in. O.S., 48, N.W. and S.W. See *S.A.C.*, LVIII, pp. 80-90. For Celtic road, lynchets, circus and long barrows, see *S.A.C.*, LXVI, pp. 163-175.

B. Chichester Dykes.—These great ramparts are among the most massive and longest in Sussex. The first line extends from Ounce's Barn, Halnaker, through Goodwood Park, the Valdoe, and East Lavant to West Stoke. From E. Lavant a branch runs southwards through the grounds of Graylingwell Asylum towards the E. gate of Chichester. Another line branches off from the last near the Barracks and runs westwards through the grounds of Oakwood House, where it is lost. In each case the earthwork consists of a single bank and ditch, the latter being to the N., or, in the case of the Graylingwell branch, to the E. Nothing whatever is known of the origin or purpose of these works, but they seem to be connected in some way with the city of Chichester. 6 in. O.S., 48, S.W. and S.E., 49 S.W., 61 N.W. and N.E.

C. Harrow Hill : 6 in. O.S., 50, S.E. The remains of what looks like a kind of Celtic farmstead lies on the back of the ridge between Michelgrove and the top of Harrow Hill. It is connected with a grassy road of double lynchet type. Described in *S.A.C.*, LXIII, pp. 32-5, with plan.

D. Cock Hill, a spur of Blackpatch Hill : 6 in. O.S., 50, S.E. A small, roughly circular enclosure surrounded by a bank with ditch on inner side, and containing two pits in the enclosed area. Date and purpose unknown. Described in *S.A.C.*, LXIII, pp. 35-8, with plan.

E. Valley Entrenchments.—These are generally rectangular enclosures situated in the bottoms of valleys or on the hill slopes near the bottom. Their purpose was almost certainly the folding of cattle or sheep, or in a few cases they may mark the sites of oxteddles, or stalls for oxen used in ploughing. Their date may range from the Bronze Age (as at Beltout) to medieval times (as in the valleys S. of Kithurst Hill). The subject has been specially studied by Mr. H. S. Toms, who has discovered the majority of the known examples.

1. Beltout, near the old Beachy Head Lighthouse ; 6 in. O.S., 82, N.E. Two intersecting valley entrenchments, partially excavated by Mr. H. S. Toms and others in 1909, and referable to the Bronze Age. They are steadily being destroyed by coast erosion. Described in *S.A.C.*, LV, pp. 41-55.

2. Home Bottom Spur (Ditchling parish) : 6 in. O.S., 53, N.W. Entrenchment later than Celtic lynchets.
3. Home and Dencher Bottoms (Ditchling parish) : 6 in. O.S., 53, N.W.
4. Eastwick Bottom (Patcham parish) : 6 in. O.S., 53, S.W. Later than Celtic lynchets.
5. Ewe Bottom (Patcham parish) : 6 in. O.S., 53, S.W. Later than Celtic lynchets.
6. Well Bottom (Patcham parish) : 6 in. O.S., 52, S.E.
7. Dyke Valley (Poynings parish) : 6 in. O.S., 52, S.E. Partially excavated by Mr. Toms and others in 1908 with indecisive results. It is almost certainly the site of a medieval ox-stall.

   Nos. 2-7 above are described and planned by Mr. Toms in *Brighton and Hove Archæologist*, II (1924), pp. 57-72.
8. Piddingworth (Ditchling parish) : 6 in. O.S., 53 S.W.
9. Faulkner's Bottom (Plumpton parish) : 6 in. O.S., 53, N.E. Later than typical Celtic road.
10. Ashcombe Bottom (Falmer parish) : 6 in. O.S., 53, S.E. A double entrenchment.
11. Houndean (parish of St. John Without, Lewes) : 6 in. O.S., 54, S.W. Later than Celtic lynchets.
12. Swanborough Combe (Iford parish) : 6 in. O.S., 67, N.W.
13. Newmarket Plantation (Falmer parish) : 6 in. O.S., 66, N.E.

    Nos. 8-13 above are described and planned by Mr. Toms in *Brighton and Hove Archæologist*, III (1926), pp. 42-61.
14. Storrington Bottom, 1,000 yards N.E. of Harrow Hill : 6 in. O.S., 50, S.E. Described in *S.A.C.*, LXIII, p. 38.
15. Chantry Bottom, Kithurst Hill, near Storrington : 6 in. O.S., 50, N.E. Two contiguous entrenchments associated with an irregular pitted and terraced area yielding shards of medieval pottery, thirteenth to fifteenth centuries. Hence these entrenchments probably belong to that period. See *S.A.C.*, LXIV, pp. 11-13, with plan.

16. Lepe Bottom, Kithurst Hill : 6 in. O.S., 50, N.E. Two valley entrenchments, probably medieval. See *S.A.C.*, LXIV, pp. 13-15, with plan.
17. Bible Bottom, N. of Mount Caburn; 6 in. O.S., 54, S.E. A double rectangular enclosure fancifully likened to an open book, whence the name.

ADDENDUM

F. Kingston Buci (near Hove), on site of present flint-diggings W. of Kingston Lane and S. of the Brighton-Old Shoreham road ; 6 in. O.S., 65, N.W. A most interesting settlement-site has been disclosed by the flint-diggings during the last twenty years. A beaker vessel, attributed to the seventeenth century B.C. (Early Bronze Age) was found, and also evidence of continuous occupation from the end of the Bronze Age (barrel-urn period) to the fourth century A.D. The report is expected to appear in *S.A.C.*, LXXII (1931). There are no visible earthworks here. In one of the market-gardens to the S. of the flint-diggings a Roman well has been discovered, more than 25 ft. deep, and steened with flints. It contained Roman pottery and human remains.

G. Other miscellaneous earthworks near Brighton are described by Mr. H. S. Toms in *S.A.C.*, LXVIII, pp. 178-197, and others near Burpham in *S.A.C.*, LXIII, pp. 1-53 (Curwen).

It should always be borne in mind that earthworks are not necessarily prehistoric, but may be medieval.

Chapter VIII

THE DETECTION AND MAPPING OF EARTHWORKS

> Being in correspondence with most of the virtuosi of his time, who, like himself, measured decayed entrenchments.
> —Scott, *The Antiquary*.

This chapter is intended to help those who would like to take an out-of-door interest in ancient earthworks, but who, from a conscious ignorance of the subject, do not know how to begin. For the encouragement of such it may be said that those who know most are as conscious of ignorance as those who know least, because until lately very little methodical study has been given to what is really a new branch of historical science.

Unfortunately the wordy speculations of old writers have created the impression that such a study is a musty, dry-as-dust affair at best, fit only for old fogies in their dotage, and to be associated in the mind with dust, stuffiness and cobwebs. Nothing could be further from the truth. Earthworks provide a large part of the raw material for a most fascinating study of human nature, all the more interesting because the subjects have been dead some two thousand years or more, yet they none the less possessed natures like our own and similar passions and emotions. Viewed from this point, earthworks are anything but dry, though it is admitted that the attempt to make the dead bones of the past live

again has not the same practical value as the restoration to life of the spiritually dead around us to-day. Nevertheless it has a recreational value for tired workers for the very reason that no great issues or overwhelming responsibilities are attached to it, so that a man possessed of an enquiring mind may well take it up as a hobby in his spare time.

The qualifications for this study are three in number: (1) opportunity; (2) ordinary powers of observation; and (3) ordinary powers of deduction, otherwise known as common sense. The student will be successful in proportion to the extent of his possession of these qualifications. A useful addition is an acquaintance with what little is known of prehistoric earthworks in general, an epitome of which it has been the aim of this book to provide.

The advantages of this study as a hobby include: (1) an incentive and objective for out-of-door exercise, stimulating the hunting instinct; (2) the sharpening of the faculties of observation and deduction, so that body and mind will be exercised together; and (3) the arousing of a healthy interest which is stimulated by the knowledge that one has the opportunity of breaking fresh ground and of discovering earthworks which very possibly no one has noticed before.

An earthwork may perhaps be defined in its broadest sense as any interference with the surface soil brought about by human agency, other than that immediately concerned with the construction of masonry. This will include the work of both spade and plough. We, however, are only concerned with such earthworks as are ancient.

As far as the chalk Downs are concerned it can probably be taken as an axiom that any break in, or departure from, the smooth, flowing outline of the hills and valleys is the result of human interference in some form, whether ancient or modern. The sea

cliffs are the only exception to this rule as far as the author's experience goes.

If, then, in the course of a walk on the Downs a bank, pit, ditch, mound, or a combination of these are noticed, the enquiring mind naturally asks two questions: (*a*) when was it made? (*b*) why was it made?

The frequency with which ignorance of the age or purpose of earthworks has been confessed in the preceding chapters shows that only too often these questions cannot be answered without excavation, and not always then. Excavation, however, is costly in time and money, and is an art which ought only to be undertaken by those who have been personally instructed in the principles by which it is governed; otherwise, not only will the conclusions be untrustworthy, but irreparable harm will have been done, for the digging will necessarily have destroyed any evidence that might otherwise have been correctly interpreted by a skilled investigator.

Frequently, however, a good deal can be learnt by common sense observation and deduction on the surface of the ground.

(*a*) In answering the first question, as to the period of construction, the first point to be settled is—is the earthwork ancient or modern?

If a bank or mound be ancient it will appear relatively wide, smooth and rounded off, or, in other words, well consolidated. The turf on it may be thick, or trees of considerable age may be growing out of it. Similarly, an ancient pit or ditch displays contours softened and rounded by time, and has a thick covering of mould and turf in the deepest parts.

A modern bank or mound has the reverse qualities. Banks marking parish or estate boundaries, and also hedge-banks, are a frequent source of confusion, but these are usually marked as a continuous black line on the six-inch Ordnance Survey maps. These banks,

unless very old, are relatively steep-sided and angular, and have ditches to correspond.

Having reason to believe that an earthwork is ancient, something may perhaps be learnt as to the period of its construction, at any rate within wide limits. Whenever possible it should be noted how two or more earthworks behave towards one another. For this purpose the lynchets, or old cultivation banks, are most useful, because being found distributed over wide areas they frequently come into relation with other earthworks. If the lynchets in question belong to fields of Celtic rather than of English type, as described in a previous chapter, one may be able to note whether the other earthwork under consideration (i) forms part of the same system with the lynchets, as in the case of a contemporary road between banks, or (ii) whether it is evidently partly destroyed by the lynchet, or, again, (iii) whether it is constructed over the cultivation terrace. In any of these three cases the earthwork would be either (i) contemporary with, or (ii) earlier than, or (iii) later than, the Celtic period.

In many cases an earthwork may be discovered without any lynchets or other clues by which it may be dated. In such cases the features of the work should be noted, and then perhaps on a subsequent occasion an earthwork with corresponding features may be found in conjunction with some lynchets, a Roman road, or other structure which will throw light on the period of its construction.

For example, a ditch between two massive banks is observed running athwart a ridge, and no clue as to its period is available. On another day a precisely similar work is found to be cut in two by the Roman road, Stane Street, on Glatting Down. Such earthworks may, therefore, be pre-Roman. Again, on another occasion an earthwork answering to this description is found to be associated with evidently

contemporary lynchets of Celtic type, as on Highden Hill. Such earthworks may, therefore, have been in use in the Celtic period or earlier. But caution must be urged against assuming that an earthwork was necessarily used in one period only, or for a single purpose. It may have been subjected to different purposes in different periods.

(*b*) The second question, as to the purpose of the earthwork, can often be answered by observing for what use it is adapted.

The possible uses of banks and ditches may perhaps be summarised as: (1) defence; (2) boundaries; (3) enclosures, pastoral, religious or sepulchral; (4) roads; (5) water-channels and drainage; and (6) habitation-sites. To these may be added (7) lynchets, though they are not strictly banks, but are a by-product of cultivation.

In considering this question attention should be paid to (A) the ground plan of the earthwork; (B) the cross-section of its banks and ditches; and (C) its relation to the rise and fall of the ground. Under these three headings the seven possible uses may be considered in tabular form (p. 152).

Percussion

It happens too often that earthworks have been levelled and obliterated by agricultural or other processes. Where this is suspected, filled in ditches and pits can sometimes be detected by striking the ground with a heavy rammer and noting whether or not the ground sounds "hollow." Over undisturbed chalk or a bank of consolidated chalk rubble the note produced is high-pitched and dull; over mould or the loose material filling a pit or ditch it is low-pitched and resonant. The two types of note may be compared respectively to the sounds "thud" and "thoomp." The detection of the difference requires a sensitive ear but it is not at all difficult;

Purpose.	(A) Ground Plan.	(B) Cross-Section.	(C) Relation to Rise and Fall of Ground.
1. Defence.	An enclosure; or else one or more banks and ditches thrown across a ridge or across the neck of a promontory	Ditch nearest enemy, and *below* bank. If there are two banks, the higher and bigger is nearest the defenders. May be several parallel ditches and banks. Banks are massive.	The position must be defensible—generally higher ground defended against lower.
2. Boundaries.	Enclosing spaces, large or small. See if marked on 6 in. O. S. They do not run through but between villages, i.e. *separating* them.	Only has a single ditch and bank, not massive. Where junctions occur, banks are continuous, ditches broken.	Variable; may lie in situation impossible for other uses, e.g. straight up steep hillside.
3. Enclosures, pastoral, religious, or sepulchral.	Enclosures; rectangular, circular, or subcircular.	Single bank and ditch, not massive. Ditch inside or outside bank.	If rectangular in valley, prob. pastoral and generally medieval. If on hilltops, possibly religious, but may be for defence; see (1). If small and circular, and not above 50 yds. diam., prob. a barrow.
4. Roads.	Wandering, branching, and going to or through villages, i.e. *connecting* them.	Ditch between two banks, sometimes several such roads run parallel, side by side. Floor of ditch when excavated often not more than 1½ ft. wide. If between fields, often runs on a ledge on side of lynchet—"double lynchet."	Follows a course that a traveller would be likely to take, e.g. ascends steep hills obliquely. Sometimes runs athwart a ridge to connect two valleys, in which case faint terrace roads often run down the valleys from the ends of the ditch.

Purpose.	(A) Ground Plan.	(B) Cross Section.	(C) Relation to Rise and Fall of Ground.
5. Water-channels and drainage.	Feeding ponds, bounding roads, etc.	The ditch is the prominent element; banks variable.	Situation such that water can flow, or that drainage is usefully accomplished.
6. Habitation-sites.	Irregular, often complicated. The individual elements may come under any of the above headings,		Generally on crest of gently sloping ridge, if Celtic. If in valleys, prob. medieval.
7. Lynchets (product of cultivation).	Series of contiguous rectangles or portions thereof, representing ancient fields. If Celtic, length of field does not generally exceed 400 ft. and breadth is not less than 100 ft. If length is about 600-700 ft., and breadth 30-70, probably medieval or eighteenth century.	Bank falls on one side only, more or less level ground on the other. No ditch. May be from a few inches to 30 ft. high.	On gently sloping hillsides.

it is aided by the sense of vibration transmitted to the hands through the handle of the rammer and to the feet directly from the ground itself.

The best instrument to use is a navvy's iron rammer, fitted with a long wooden handle. A stout log of wood will often serve but has not the concentrated weight of the iron tool. In the absence of any suitable rammer mere stamping with the feet may yield some information as to the nature of the subsoil.

The method is entirely defeated if there is much mould overlying the undisturbed chalk, for mould yields a resonant note and will render impossible the distinction between the notes obtained from disturbed and undisturbed subsoils. For a similar reason long and tangled grass is a great hindrance to the usefulness of percussion of the ground as a means of discovering lost earthworks. The method is of undoubted value on a chalk subsoil, provided that the latter is not covered with too great a depth of mould, but whether it would be so useful on other soils remains to be seen. Its essential value lies in distinguishing between compact and loose soil.

The best circumstances in which to be able to distinguish a change of note are as follows. The day should, if possible, be quite windless. As this is not always possible of attainment, the next best thing is to have an assistant hidden near by in a natural or artificial hollow, out of the wind. There is no better position for this than the trench of an excavation, for the vibrations of the percussion are conveyed through the soil for long distances, and an assistant stationed below ground is in the best position to distinguish " thud " from " thoomp," undisturbed by extraneous sounds.* As soon as he hears a change

* While excavating in a deep trench on one occasion the author was able clearly to distinguish the change of note obtained by a colleague percussing the ground some hundreds of yards away.

of note he calls or signals at once to his colleague who wields the rammer, and the latter marks the spot on the ground with a small peg. By systematically going over the ground in this manner and marking with pegs the points where the note changes, it is sometimes possible to reconstruct the complete plan of vanished ditches and pits. It was in this way that the plans of the neolithic ditches at the Trundle and at Whitehawk Camp were recovered (Plates XVI and XIX).

Surveying

Having discovered an unrecorded earthwork the next step is to make a plan of it for purposes of record. This should be done as accurately as circumstances permit, and the resulting plan either published in one of the journals specially devoted to such matters, or else placed where it may be permanently accessible to others, as in a public library.

The surveying of earthworks is not at all difficult and requires no special attainments greater than a little elementary geometry. Accordingly, some simple methods will here be described, which the author has found useful in practice. As large areas of land are not generally involved, the instruments necessary are not numerous or very expensive. They comprise the following :

(1) Two reel-tapes, one of which should preferably be 100 ft. long, and the other not less than 66 ft.

(2) A prismatic compass such as was served out to officers in the war.

(3) A light folding camera-tripod of *wood*, with no metal fittings other than brass ; this is to carry the compass, and it should have a flat baize-covered top.

(4) A spirit-level, 10 in. long ; or, preferably, if possible, a small portable clinometer.

(5) A number of bamboos (say, a dozen), 6 ft. long, and fitted with small scarlet flags.

(6) Two or three dozen pegs of wood or stout iron wire, each fitted with a tag of scarlet cloth, and conveniently referred to as " poppies."

(7) A dressmakers strong tape-measure, 5 ft. long, and fitted with a lead plumbline-weight at one end, in such a way that the inches on the tape indicate the distance accurately from the bottom of the lead. This is the " drop-tape."

(8) A serviceable note-book and pencil. It is a convenience if the former contains squared paper.

The various methods employed are extremely simple in principle, and their application is merely a matter of common sense. The method selected depends on the shape and extent of the earthwork to be surveyed, and also on the degree of accuracy aimed at. While it is true that the value of a plan is in proportion to its accuracy, nevertheless, there are degrees of extreme meticulousness which, in relation to the scale to which the plan will be drawn, are sheer waste of time. If, too, the surveyor's opportunity and time are strictly limited, it is better to have a rough plan than none at all.

All the methods depend on this : certain strategic points are marked by flags on the ground, and their relative positions are determined by measuring the distances in feet, and taking the compass bearings in degrees, between each flag. These figures are taken down, and from them the positions of the flags can be accurately plotted to a suitable scale on the plan. These fixed points having been determined, any point on the outline of the earthwork can be plotted by measurement either of distance with the tape, or of angles with the compass, or both.

The use of the prismatic compass is best learnt by personal demonstration. The circumference of the dial is divided into 360 degrees, measured clockwise

from magnetic north round by east, south and west and back to north again. It will thus be seen that an object due east of the observer (O) will give a reading of 90°, i.e., the angle between north and east is 90°. Similarly, due south will read 180°, and due west 270° because all angles are read clockwise from north. Thus, in taking the bearing between two flags, A and B (Fig. 1), the observer stands at A and trains his compass on B, and the angle (x) read off on the dial is that subtended at A between the magnetic

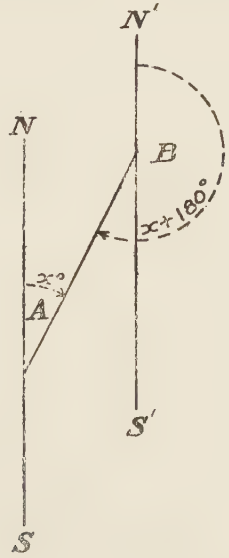


Fig. 1.

north-point (N) and B, viz., the angle NAB. If now the observer goes to B and trains his compass on A, the angle read off will be N'BA, measured clockwise, and this, as is obvious from the figure, will be equal to $x+180°$, or, in cases where x is already more than 180°, to $x-180°$. If, therefore, the distance between A and B is measured in feet, and the bearing taken with the compass from A to B, and checked by taking it again from B to A, these two points can be plotted on

the plan in relation both to the scale chosen and to the magnetic points of the compass. In this manner all the necessary fixed points can be marked on the plan.

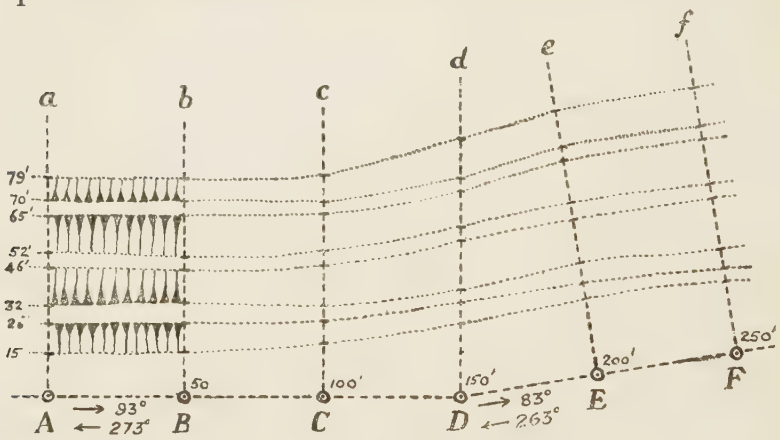


Fig. 2.

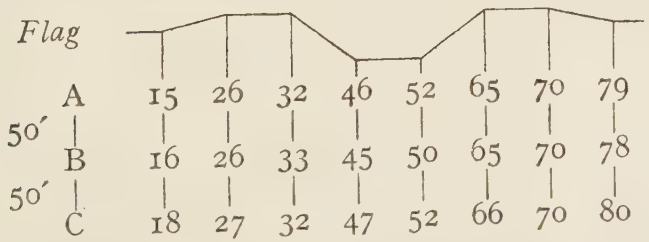
Linear Earthworks (Fig. 2).

The choice of positions for flags on the ground turns on the shape and extent of the earthworks to be surveyed. In the case of a long rampart such as a "covered way" a number of flags (A, B, C, etc., Fig. 2), should be set up at measured intervals of 50 or 100 feet in a line parallel to the earthwork. If the latter bends, this "base line" or "traverse" (A-D-F) can be deflected to follow it, the changed direction being registered with the compass. This being done, measurements called "offsets" (A*a*, B*b*, etc.) are taken *across* the earthwork in a direction at right angles to the base-line. For this purpose the ring of a tape is fastened to the flag A, the other end of the tape being at *a*, and wherever this line crosses the bottom or top of the slope of a bank, the number of feet from A is noted. As many offsets may be taken as circumstances may require, and they

can be taken from any point on the base-line, not necessarily opposite the flags. When all the required offsets have been measured and plotted on the plan, the corresponding points on each can be joined by lightly pencilled lines, and then the direction of the slope of the banks can be shown by filling in the spaces between these lines with the commonly accepted conventional *hacheurs*, consisting of marks shaped like wedges or tadpoles, and placed so that their thick ends represent the top of the slope.

This method may be applied in surveying the ramparts of camps, but in this case the " traverse " will be " closed," that is, it will come round in a more or less circular course to its starting-point. Great care will be necessary in taking the readings and in plotting them, or the traverse will fail to close on the plan, but even with a small compass great accuracy can be obtained.*

In actual practice it is not necessary to take the plan on to the field ; all the necessary data can be taken down in the form of figures in the field-book, aided by rough sketch-plans and conventional signs sufficient to show what each figure refers to, and from these the plan can be drawn at leisure by the fire-side. The data, for instance, in Fig. 2 might be entered after this manner in the field-book :



* In plotting the plan of Whitehawk Camp (Plate XIX) a traverse of 1,700 ft. with 15 changes of direction closed on the plan with an error of less than 0.01 in., representing only 6 in. on the ground. Almost as great accuracy was obtained in surveying the Caburn and the Trundle.

In the left-hand column are the flags A, B, C, etc., with an indication that they are placed 50 ft. apart. Opposite each flag are the distances in feet measured in offsets from each flag to the bottoms and tops of the slopes of the earthwork, and in order to show what each figure refers to, a conventionalised section of the earthwork can be sketched at the top.

This method is the most accurate, and is simplicity itself. The ingenuity of each surveyor will enable him to invent his own improvements on this scheme, and where earthworks are more complicated than in the above example, a rough sketch-plan in the note-book will help to keep the lists of figures clear.

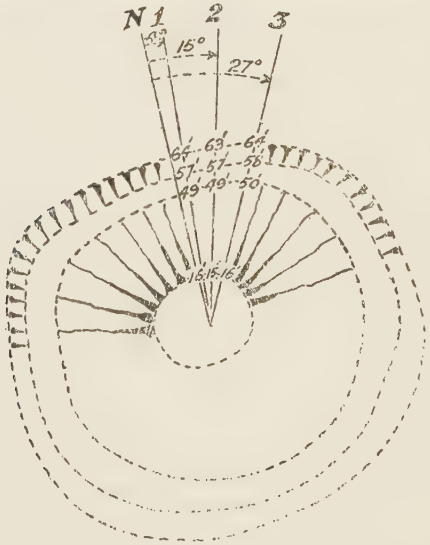


Fig. 3.

Barrows, etc. (Fig. 3).

In the case of a small round earthwork, such as a barrow, of radius not more than 100 ft., it is convenient to modify the above plan by taking only one fixed point (A) somewhere about the centre of the work to be

planned (Fig. 3). The tripod carrying the prismatic compass is set up at this point, and a number of "poppies" are placed at short intervals round the circumference of the earthwork. The ring of a tape is attached to a peg at A under the compass, and measurements corresponding to those of the offsets in Fig. 5 are taken between A and each poppy in turn. The positions of the poppies are also determined by means of compass-bearings taken from A. Radial offsets are obtained in this way, and plotted in a similar manner to those taken at right angles to a base line. If the "poppies" are numbered in order, the offsets can be entered thus in the field-book :

Poppy.	*Bearing from* A				
(1)	4°	16	49	57	64
(2)	15°	15	49	57	63
(3)	27°	16	50	58	64

—and so on round the circle.

Fig. 4.

Triangulation With Prismatic Compass

In cases where it is desirable to locate a large number of isolated points spread over a fairly wide area of ground, such as a group of flint-mine shafts or the corners of the fields of a lynchet-system, triangulation with the prismatic compass affords a rapid and tolerably accurate means. This method depends on the

fact that, given two fixed points A and B (Fig. 4), any unknown point X can be determined by measuring the angles XAB and XBA and drawing a triangle on the plan with base AB, when the position of the apex will give X. In actual practice it is essential that the angle AXB should be as nearly as possible a right angle, preferably between 80° and 100°, certainly between 60° and 120°, otherwise, if this angle is either too acute or too obtuse, it is easy to see that the minimum error in reading the compass will produce the maximum misplacement on the plan.

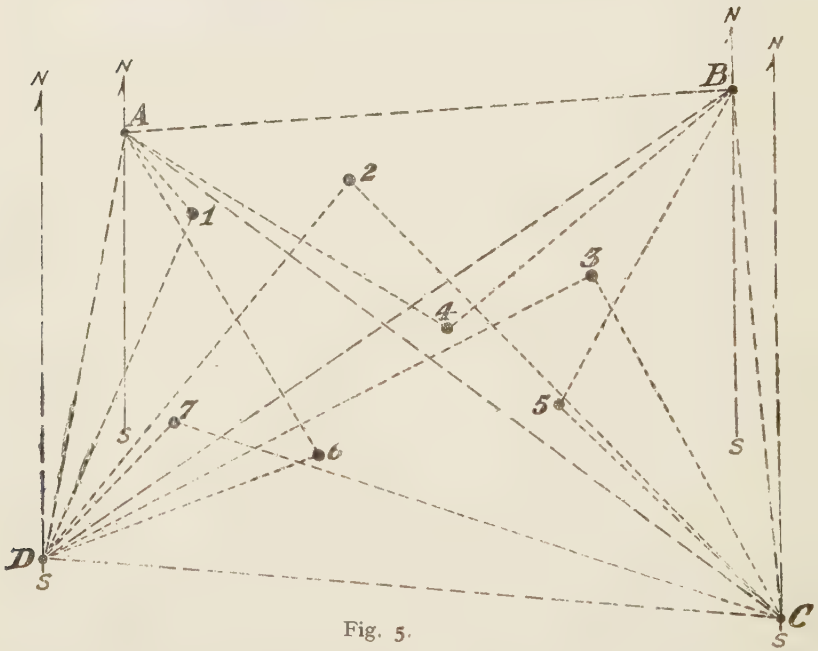


Fig. 5.

Unless this rule is adhered to, triangulation may be a very inaccurate method indeed, but due regard to it will give very satisfactory results.

As it is obvious that no single pair of fixed points

will subtend a right angle at each of a large number of scattered unknown points, it is advisable to set up several flags in the most strategic places, so that at least one pair of them shall subtend something like a right angle at each of the unknown points to be plotted. In the case of an elongated area to be surveyed a long base-line is useful, with flags set up at regular measured intervals. If the area to be plotted is not much more than 150 yards in diameter the best arrangement is to place a flag at each corner of a quadrilateral enclosing the area (Fig. 5). The distances and compass-bearings from each flag to the other three are then taken and noted, so that their positions can be accurately plotted on the plan. Too great care cannot be taken in determining the positions of the flags, and every compass-bearing ought to be checked by taking the bearing in the opposite direction, i.e., from B to A as well as from A to B, and seeing that the difference between these readings is exactly $\pm$ 180 deg.

These points having been fixed, the triangulation of the unknown points may be begun. Taking the typical case cited above, where A and B are the two fixed points and X the unknown point (Fig. 4), it is not necessary in practice actually to measure the angles XAB and XBA. Seeing that the compass-bearings between A and B are known, it is only necessary to take the bearings respectively from A and B to X, or, what comes to the same thing and is more convenient in practice, to take the bearings from X to A and B. The simplest plan, therefore, is to carry the compass and its light tripod round to all the unknown points in turn, and from each of them to take bearings on to two of the flags, selected so that the angle between the two bearings is as nearly as possible a right angle (Fig. 5). The readings are then entered in the field-book thus :

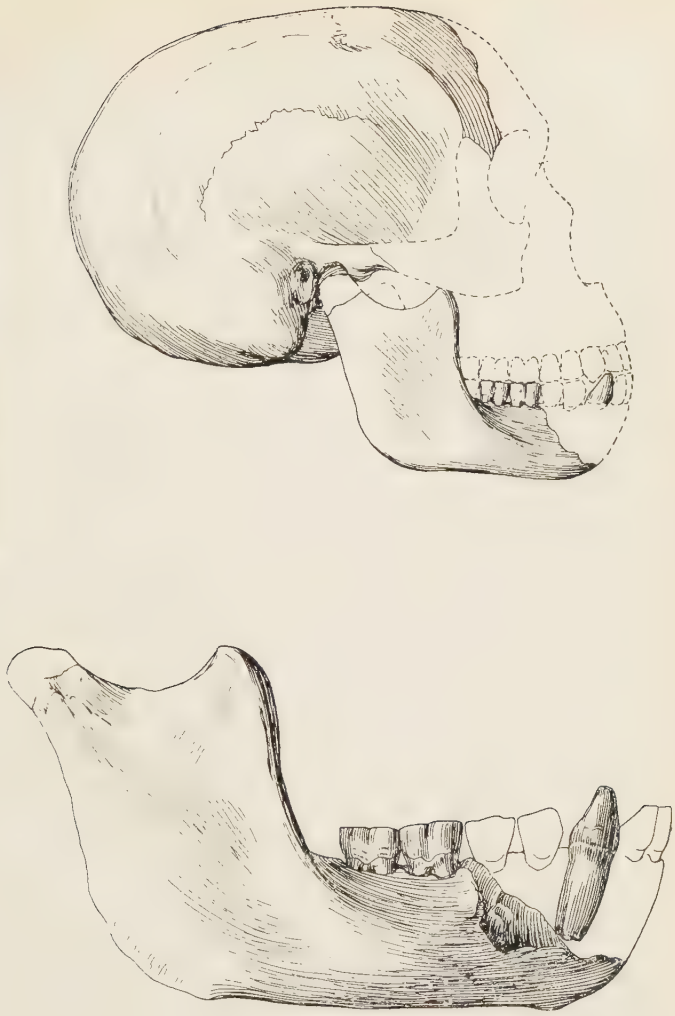
Fixed points :

A-B = 44 ft.	A-B = 86°	C-A = 307°
A-D = 31½ ft.	A-C = 127°	C-B = 355°
B-C = 38½ ft.	A-D = 191°	C-D = 274°
D-C = 53 ft.	B-A = 266°	D-A = 11°
A-C = 58½ ft.	B-C = 175°	D-B = 56°
B-D = 60½ ft.	B-D = 236°	D-C = 94°

Triangulation :

	First Bearing		Second Bearing		
Stn.	Direct	Reverse	Direct	Reverse	Remarks
(1)	A 320°	*140°*	D 203½°	*23½°*	
(2)	C 136°	*316°*	D 219°	*39°*	
(3)	C 152°	*332°*	D 242½°	*62½°*	
(4)	A 301½°	*121½°*	B 50°	*230°*	
(5)	B 29°	*209°*	C 134½°	*314½°*	
(6)	A 329°	*149°*	D 249½°	*69½°*	
(7)	C 108°	*288°*	D 223°	*43°*	

The figures in brackets in the left-hand column of the triangulation data refer to the different unknown points or stations, and these can be shown in their relative positions in a rough sketch-plan in the field-book if necessary, especially if these points represent the corners of lynchet-fields, in which case it is necessary to indicate in the sketch-plan the way in which the lynchets run between them. The next four columns are assigned to the two bearings, two columns to each. In the first of these two columns the readings are entered as read on the compass together with the letter (A, B, C, etc.) indicating the flag on which the bearing is taken ; the second column is left blank so that the reverse readings, i.e., the direct readings ± 180 deg., can be entered at leisure. The reason for this will be plain when one realises that in



By kind permission of Sir A. Smith Woodward and the Editor of the Geological Magazine

PLATE XXXII

THE PILTDOWN SKULL (RESTORED).

plotting these bearings on the plan at home, the protractor must be centred on the known points, whereas on the field the bearings have been taken from the unknown. The last column of all is usefully reserved for such notes as the diameter of a pit of which the central point is being triangulated.

When plotting the bearings on the plan at home in the evening, a vertical line must first be drawn lightly through each of the fixed points to represent north and south. The protractor should be circular, not less than five inches in diameter ; it should be of transparent celluloid, and should be divided into 360 degrees numbered consecutively round the circumference in a clockwise direction. This instrument can then be used to plot the *reversed* bearings from the various fixed points, and wherever each pair of bearings cut one another is the corresponding unknown point.

When the plan is completed it is essential to add a scale of feet and also an arrow indicating north. In connection with the latter it must be remembered that the *magnetic* north to which the needle of the compass points is some degrees *west* of true north, and it is the latter that should be indicated on the plan. The difference between true and magnetic north varies from time to time and in different places, but it is round about 14 deg. The exact figure should be obtained by inquiry from the Ordnance Survey Office, Southampton.

The following points should be borne in mind when triangulating :

(1) Keep the angle subtended at the unknown point as nearly as possible a right angle, as already emphasised.

(2) When selecting two flags on which to take bearings be particularly careful to avoid confusion. For example, to enter flag B in the book when the bearing has been taken on flag C will lead to gross error.

(3) The nearer the flags are to the unknown points, the smaller will be the chances of error. For instance, an error of half a degree in the reading of a bearing will involve a misplacement of only 5 inches at a distance of 50 feet from the flag, while at 500 feet the misplacement would be over 4 feet for the same error in reading.

The three methods of surveying which have been described can conveniently be combined to any desired degree when dealing with complicated or extensive earthworks.

It is hardly necessary to add that, when drawn, the plan should be taken back to the field and rigorously checked to discover errors or inaccuracies.

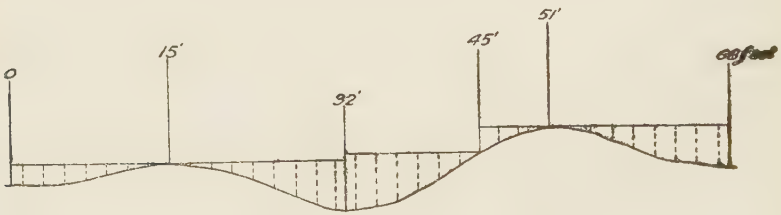


Fig. 6.

Vertical Sections (Fig. 6).

Besides making a plan of an earthwork it is generally desirable to record its profile as it would appear if cut across by a trench. Such a vertical section will show the heights of the banks in relation to the ditches, and the steepness of the slopes. The principle consists in stretching horizontal tapes across the banks and ditches, from which vertical offsets are obtained at short intervals by means of the drop-tape. For this two pairs of hands are essential; three are better.

The line of the desired section should first be marked out by flags or poppies. Then at the highest point on this line the ring of a long reel-tape should be

securely pegged into the ground. Further down the bank on the line of the section a flag is set up, and a point on its staff is found by means of a spirit-level to be exactly level with the ring of the tape. The tape is then drawn tight and wound round the flag-staff at this level, which should not be more than five feet above its foot. The tape thus forms a horizontal base-line for part of the section, and from it at intervals of one or two feet, carefully measured, the drop-tape should be lowered to ascertain the depth of the turf below the base-line. These readings in *inches* are entered in the field-book opposite the number of the feet on the base-line at which they were taken.

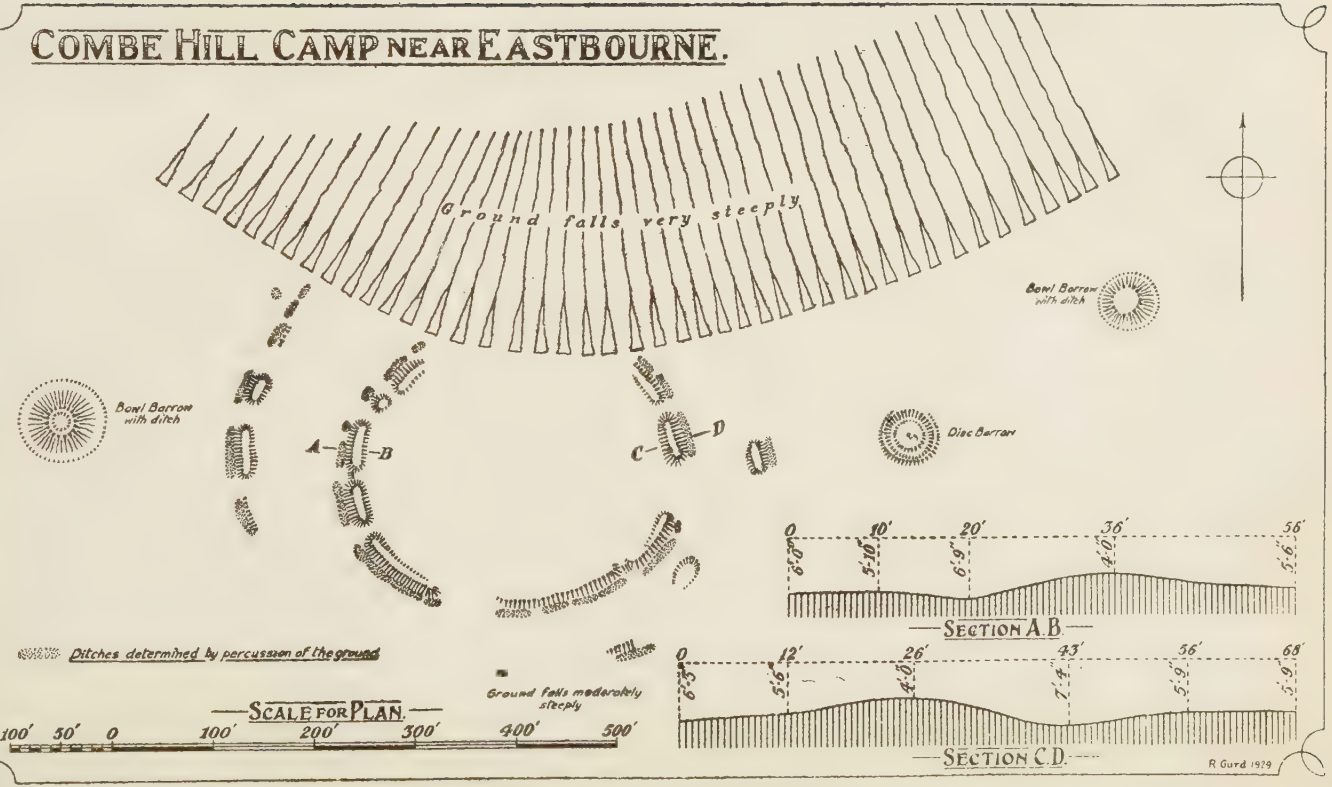
When this has been done, a fresh level is taken from the staff of another flag to the base of the first flag, the reel-tape again fixed, the difference in level noted, and offsets taken as before. This process is repeated at as many levels as may be necessary to cover the whole line of the section.

It is a simple matter to draw the section on paper to a suitable scale from the measurements taken, but it must not be forgotten to indicate on the plan the point at which it was made, and by suitable lettering to show its relation to the points of the compass. The provision of a scale is also essential.

. . . . .

Other methods of surveying exist, but the author has confined himself to a description of those of which he has had personal experience, and which he has found useful. The plane-table is advocated by some, but suffers from the drawback that it necessarily exposes a large sheet of paper on a board to the frolics of the wind and the risk of rain. But, however, it is done, the beginner will find that the thing will "grow on him," and that it becomes a physical and intellectual sport, and a fascinating hobby.

COMBE HILL CAMP NEAR EASTBOURNE.



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